

CLASS 174, ELECTRICITY: CONDUCTORS AND INSULATORS**SECTION I - CLASS DEFINITION**

1. This class is for inventions relating to the structure of electrical conductors and insulators and insulators and the apparatus specialized to mounting, supporting, encasing in conduits, and/or housing the same.

2. Conductors may be bare or be encased in insulation, may be single strand or plural strand, may be of single conductor form or there may be a plurality of conductors associated together to form a cable.

3. Since all materials that have the property of being conductors of electricity and all devices made therefrom may be termed electrical conductors, only those structures that are specially designed to conduct electricity as their proximate purpose are placed in this class.

4. Insulators are placed here when the structure thereof is claimed, which structure is specially designed for spacing two or more devices of different electrical potential from each other or for spacing one or more devices from ground.

5. Since all materials which are poor conductors of electricity and devices made therefrom may be termed electrical insulators, only those structures whose proximate purpose is that stated in the preceding paragraph are placed in this class.

6. Conduits are placed in this class only when some characteristic is claimed which limits the same to the electrical use. For reasons above stated, the fact, claimed or unclaimed, that the conduit is made of electrically conductive and/or insulative material, will not cause classification in this class. Cable systems and components are classified elsewhere. See References to Other Classes, below.

SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

1. Housings (boxes, receptacles, containers, etc.) are placed in this class only when limited to electrical use. The mere fact, claimed or unclaimed, that the material of which the box or housing is composed is conductive, and/or insulative, will not cause classification in this class. See D, Housing, Boxes Or Receptacles, below. To be classified in this class, the claims must include some structure which limits the box or housings to elec-

trical use. The recitation that the box or housings include an electrical device, recited by name only, is sufficient to cause classification in this class even though no other structure is recited which limits the box or housings to electrical use. This class includes as boxes, housings or envelopes such as are used for electric lamps, electric space discharge devices, and similar electrical devices which are enclosed in vitreous, ceramic, nonmetallic plastic or metallic housings or envelopes. Where such subject matter is otherwise properly within the scope of this class, the mere naming of the type of lamp or discharge device as being the device within the housing or envelope will not exclude the patent from this class. Neither will the recitation of an electrode broadly recited within the housing or envelope exclude the patent from this class although if the electrode is claimed as a filament, anode, grid or other specific electrode, the patent will be excluded. Also, the recitation of electrode supporting structure when broadly recited or when recited so as to be of general utility will not exclude the patent from this class. For example, means for supporting an electrode assembly, or lead-in wires supporting an electrode will not exclude the patent from Class 174. Where the supporting structure is limited to use with electric lamp or discharge device structure, the patent is excluded from Class 174 and will be found elsewhere. For such envelopes and housings in this class, where the envelope is provided with means peculiarly adapted for use in connection with a vacuum, gas or fluid (but not merely a hermetically sealed envelope designed for use with a vacuum or gas filling where no structure peculiarly adapted for use with a vacuum or fluid except the hermetic seals is claimed) see Subclass References to the Current Class, below. Where the structure includes a current conductive fluid (e.g., a liquid used as a part of the lead-in structure) or where a vacuum is used (e.g., as a space around the lead-in designed to be continuously evacuated to reduce leakage of air or gas), see Subclass References to the Current Class, below. Where the envelope or housing has combined therewith means for feeding, circulating or distributing a fluid including means to cool the fluid or has means to cool the box or housing or the device therein where the cooling means involves the use of a fluid, see Subclass References to the Current Class, below. For miscellaneous envelopes, boxes and housings, see Subclass References to the Current Class, below. For miscellaneous hermetically sealed envelopes and housing (including housings which are provided with an evacuating stem or opening or which use a liquid to form the hermetic seal) see Subclass References to the Current Class, below. For structures which are bushings or other devices for insulating a conductor or object from a wall or plate through which the conduc-

tor or object passes, see Subclass References to the Current Class, below. For such envelopes and housings provided with an electric shield which wholly or partially surrounds the envelope and for such envelopes and housings which include means to shield the housing or a part thereof from electromagnetic or electrostatic effects, see Subclass References to the Current Class, below. For miscellaneous such boxes and housings, see Subclass References to the Current Class, below. For miscellaneous hermetically sealed envelopes and housings in this class, including those provided with lead-in wires or other conductive means for conducting electricity to the device within the housing, see References to Other Classes, below. Note that this class provides for devices (e.g., bushings) for insulating a conductor from a wall or plate (such as a metallic envelope wall) through which the conductor extends, the bushing may be fluid tight and include a glass to metal seal. See Subclass References to the Current Class, below.

2. The main use of electrical conductors is to conduct electricity to an electric translator for using the same. Such electric translators are frequently positioned in the conductor conduit or housing. The mere inclusion of such translator broadly in the claim, without setting forth the characteristics thereof, will not exclude the same from this class but where particular characteristics of the electric translator are claimed, classification is in the class appropriate to such translator.

Whereas housings for electronic devices and components are also provided for elsewhere, Class 257 provides for housings (1) wherein the housing is for an active solid state device, details of which are positively recited in the claims, or (2) wherein the recited housing is necessary to make a usable active solid state device whether or not the active solid state device is recited nominally or in detail.

Claims that recite housings with only nominal recitation of active solid state devices of only one type should not be classified as originals (ORs) in either Class 257 or Class 361, but rather in Class 174.

3. Processes other than manufacturing processes, are classified in this class in the subclasses with the correlative structures.

A. MISCELLANEOUS

Compounds and compositions which are dielectrics, and their manufacture, are classified elsewhere. Ceramic compositions useful as electrical insulators are classified elsewhere. Compositions containing a synthetic

resin having utility as a filling or flooding composition for cables or to processes of preparing said composition are also classified elsewhere. (See References to Other Classes, below.) The claimed combination of conductor, coated or covered with the dielectric, is in this class (174) when such combination includes some structure of the conductor other than a mere wire, cable, etc., coated with the dielectric. Fluid dielectrics and processes which cover merely the use of the fluid dielectric to insulate electrically conducting elements from each other or from ground are elsewhere. The combination of such fluid dielectrics with particular structure, or processes of use with particular structure or with conducting elements bearing particular relations to each other, are in this class (174) or in another appropriate electrical art class.

Processes and apparatus for making wire and filaments regardless of the material used are elsewhere. Processes for wire or filament making combined with a coating or covering operation for conductors which are no more than metal stock, even though claimed as being electric conductors are elsewhere. Process or an apparatus for making or reshaping a wire by a mere plastic metal working operation, e.g., die-drawing are elsewhere. (See References to Other Classes, below.)

For apparatus for coating conductors, see References to Other Classes, below.

Class 57, Textiles: Spinning, Twisting, and Twining, takes processes and/or apparatus for making conductors by operations within the class definition and also takes patents to conductor structure where the apparatus and/or process is also claimed. Patents claiming only conductor structure are in this class (174). Class 57 takes patents to strands of twisted or twined form not limited by the claims to being conductors. This same line exists with the other textile classes, for which see References to Other Classes, below.

Coating Processes, per se, wherein an electrical product is produced are classified elsewhere. (See References to Other Classes, below.)

Methods of making indefinite length electrical conductors are classified elsewhere. (See References to Other Classes, below.)

A residual mast or tower with an article support structure, having no claimed feature of electrical significance, is classified elsewhere. (See References to Other Classes, below.)

Metallurgical bonding, surface bonding by rod encasing, and surface bonding with mechanical shaping are classified elsewhere. (See References to Other Classes, below.)

B. CONDUCTORS AND ELECTRICAL SYSTEMS

Structures specially designed for transmitting electrical energy between relatively moving objects including the structure of conduits and conductors with the means for mounting or supporting the same, and electrical systems specialized to this use are elsewhere.

As stated in the class definition, this class (174) pertains to the structure of electric conductors. Substantially all art structures of either electrical or nonelectrical character are capable of having conductor structures associated therewith. The combination of art devices significantly claimed with conductors is with the appropriate art.

Electrical systems are with the appropriate art. Electrical systems for power, control, signaling or other purposes combined with nonelectrical art devices significantly claimed are, in general, classified with the nonelectrical art device. Electrical conductors in combination with particular electrical devices significantly claimed and classifiable in other classes are with such other classes. (See References To Other Classes, below.)

See the appropriate subclasses of this class for further notes relative to other classes.

C. CONDUITS

Conduit structures even though claimed as electrical conduits and/or claimed as made of electrically insulating and/or conductive materials are classified elsewhere. In addition to the conduit structure there must be claimed additional characteristics such as the contained electrical conductors, electrical apparatus, added insulators and/or other characteristics specialized to electrical use to cause classification in this class (174). (See References to Other Classes, below.)

A service duct within a barrier wherein a feature limited to electrical use is not claimed is classified elsewhere. (See References to Other Classes, below.)

Hydraulic and Earth Engineering, for tunnels and subways not restricted solely to electrical use is classified elsewhere. (See References to Other Classes, below.)

Conduits combined with pavement, curb or gutter structure and not limited solely to electrical use are classified elsewhere. (See References to Other Classes, below.)

Railways are classified elsewhere. (See References to Other Classes, below.)

Electricity: Transmission to Vehicles is classified elsewhere. (See References to Other Classes, below.)

See appropriate subclasses of this class for further notes relative to other classes.

D. HOUSING, BOXES OR RECEPTACLES

When claimed in combination with the contained equipment significantly set forth (other than the conductors and/or insulators), they are with the class appropriate to the contained equipment.

For envelopes for electric lamps and electric space discharge devices which are included in this class, see this section, Lines With Other Classes and Within This Class, above.

The mere structure of the housing, box or receptacle is in the class appropriate thereto. Housings and envelopes for electric lamps, electric space discharge devices and similar devices where no electrical structure is claimed, and for receptacles of the junction or outlet type are classified elsewhere. (See References to Other Classes, below.)

Underground installations, wall mounted, and other boxes and housings are located herein. (See Subclass References to the Current Class.)

This class provides for the structure of a housing, box or receptacle and electrical connector structure for making electrical contact between the lead-in conductors of the receptacle (i.e., the conductors which pass through the wall of the housing, box or receptacle) and an external circuit and for junction boxes, housings or receptacles with electrical connectors where significant structure of the housing, box or receptacle is recited in addition to the electrical connector structure. Class 439 provides for housing, boxes and receptacles with electrical connectors where no more structure is recited than is necessary to mount or support the electrical connectors. Also, Class 439 provides for electrical connectors in combination with the housing, box or receptacle for the connector (e.g., housed connectors) where significant connector structure is recited.

E. INSULATORS

See A, Miscellaneous, above, and its associated search notes in References to Other Classes, below, for dielectric compositions and compounds.

For a references to devices for electrically insulating one or more conductors or other articles or structures from one another or from a supporting structure or ground, see Subclass References to the Current Class, below.

SECTION III - SUBCLASS REFERENCES TO THE CURRENT CLASS**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 8+, where the envelope is provided with means peculiarly adapted for use in connection with a vacuum, gas or fluid (but not merely a hermetically sealed envelope designed for use with a vacuum or gas filling where no structure peculiarly adapted for use with a vacuum or fluid except the hermetic seals is claimed.
- 9, where the structure includes a current conductive fluid (e.g., a liquid used as a part of the lead-in structure) or where a vacuum is used (e.g., as a space around the lead-in designed to be continuously evacuated to reduce leakage of air or gas).
- 15.1, where the envelope or housing has combined therewith means for feeding, circulating or distributing a fluid including means to cool the fluid or has means to cool the box or housing or the device therein where the cooling means involves the use of a fluid.
- 17+, for the miscellaneous envelopes, boxes and housings under subclass 8.
- 17.05+, for the miscellaneous hermetically sealed envelopes and housing within the definition of subclass 8 (including housings which are provided with an evacuating stem or opening or which use a liquid to form the hermetic seal).
- 31+, for structures under subclass 8 which are bushings or other devices for insulating a conductor or object from a wall or plate through which the conductor or object passes,
- 35, for such envelopes and housings provided with an electric shield which wholly or partially surrounds the envelope and for such envelopes and housings which include means to shield the housing or a part thereof from electromagnetic or electrostatic effects.

- 37, and indented subclasses for underground installations.
- 48, and 49 for wall mounted housings.
- 50, and indented subclasses for other boxes and housings, and the notes thereunder.
- 50+, for miscellaneous boxes and housings.
- 50.5+, for the miscellaneous hermetically sealed envelopes and housings in this class, including those provided with lead-in wires or other conductive means for conducting electricity to the device within the housing.
- 137, see the notes to this subclass, and the subclasses thereunder for devices for electrically insulating one or more conductors or other articles or structures from one another or from a supporting structure or ground.
- 151+, for devices (e.g., bushings) for insulating a conductor from a wall or plate (such as a metallic envelope wall) through which the conductor extends, the bushing may be fluid tight and include a glass to metal seal.

SECTION IV - REFERENCES TO OTHER CLASSES**SEE OR SEARCH CLASS:**

- 19, Textiles: Fiber Preparation. (See Lines With Other Classes, "Miscellaneous," above.)
- 26, Textiles: Cloth Finishing. (See Lines With Other Classes, "Miscellaneous," above.)
- 28, Textiles: Manufacturing. (See Lines With Other Classes, "Miscellaneous," above.)
- 29, Metal Working, for processes and apparatus for making wire and filaments regardless of the material used. Included are processes for wire or filament making combined with a coating or covering operation; see subclasses 400.1+, especially subclass 460 where conductor parts are assembled and then coated, subclass 461 where a stranded conductor is joined to another member by spreading the conductor strands, and subclasses 527.1+ where a coating operation is involved. (See Lines With Other Classes, "Miscellaneous," above.)
- 52, Static Structures (e.g., Buildings), subclass 40 for a residual mast or tower with an article support structure, having no claimed feature of electrical significance. (Lines With Other Classes, "Miscellaneous")
- 52, Static Structures (e.g., Buildings), subclasses 220.1+ for a service duct within a barrier wherein a feature limited to electrical use is not

- claimed. (Lines With Other Classes, "Conduits")
- 57, Textiles: Spinning, Twisting, and Twining, takes processes and/or apparatus for making conductors by operations within the class definition and also takes patents to conductor structure where the apparatus and/or process is also claimed. Patents claiming only conductor structure are in this class (174), Class 57 taking in subclass 200 and indented subclasses patents to strands of twisted or twined form not limited by the claims to being conductors. (Lines With Other Classes, "Miscellaneous")
- 66, Textiles: Knitting. (See Lines With Other Classes, "Miscellaneous," above.)
- 72, Metal Deforming, takes a process or an apparatus for making or reshaping a wire by a mere plastic metal working operation, e.g., die-drawing. (See Lines With Other Classes, "Miscellaneous," above.)
- 87, Textiles: Braiding, Netting, and Lace Making. (See Lines With Other Classes, "Miscellaneous," above.)
- 104, Railways, subclass 140, and indented subclasses. (Lines With Other Classes, "Conduits")
- 106, Compositions: Coating or Plastic, appropriate subclasses for compounds and compositions which are dielectrics, and their manufacture. (See Lines With Other Classes, "Miscellaneous," above.)
- 118, Coating Apparatus, takes apparatus for coating conductors. (Lines With Other Classes, "Miscellaneous")
- 136, Batteries: Thermoelectric and Photoelectric. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 138, Pipes and Tubular Conduits, for conduit structures even though claimed as electrical conduits and/or claimed as made of electrically insulating and/or conductive materials. See Class 138 and the notes appended to the definitions. (See Lines With Other Classes, "Conduits," above.)
- 139, Textiles: Weaving. (See Lines With Other Classes, "Miscellaneous," above.)
- 156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 47+ takes methods of making indefinite length electrical conductors not elsewhere provided for. (Lines With Other Classes, "Miscellaneous")
- 178, Telegraphy, subclass 45 for wave transmission systems having loaded cable structures. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, subclasses 277+ for an electrical control system for an elevator car drive means and subclass 413 for a specific arrangement or connection of an electrical service line with other elevator structure. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 191, Electricity: Transmission to Vehicles, subclass 23 and indented subclasses (Lines With Other Classes, "Conduits").
- 191, Electricity: Transmission to Vehicles, has structures specially designed for transmitting electrical energy between relatively moving objects including the structure of conduits and conductors with the means for mounting or supporting the same, and electrical systems specialized to this use. (Lines With Other Classes, "Conductors and Electrical Systems," above.)
- 200, Electricity: Circuit Makers and Breakers. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 204, Chemistry: Electrical and Wave Energy. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 208, Mineral Oils: Processes and Products, appropriate subclasses for compounds and compositions which are dielectrics, and their manufacture. (See Lines With Other Classes, "Miscellaneous," above.)
- 219, Electric Heating. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 220, Receptacles, subclass 2.1 for housings and envelopes for electric lamps, electric space discharge devices and similar devices where no electrical structure is claimed, and subclasses 3.2+ for receptacles of the junction or outlet type. (Lines With Other Classes, "Housing, Boxes Or Receptacles")
- 228, Metal Fusion Bonding is the generic class for metallurgical bonding and includes (see subclasses 126+) surface bonding by rod encasing and includes (see subclasses 141.1+) surface bonding with mechanical shaping.
- 246, Railway Switches and Signals. (See Lines With Other Classes, "Conductors and Electrical Systems," above.)
- 250, Radiant Energy. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 252, Compositions, for fluid dielectrics and processes which cover merely the use of the fluid

- dielectric to insulate electrically conducting elements from each other or from ground. (See Lines With Other Classes, "Miscellaneous," above.)
- 260, Chemistry of Carbon Compounds, appropriate subclasses for compounds and compositions which are dielectrics, and their manufacture. See subclasses 2.01+. (See Lines With Other Classes, "Miscellaneous," above.)
- 290, Prime-Mover Dynamo Plants. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 307, Electrical Transmission or Interconnection Systems, appropriate subclasses for electrical distribution systems or systems for interconnecting two or more sources of electricity and/or two or more loads. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 313, Electric Lamp and Discharge Devices, for supporting structure limited to use with electric lamp or discharge device structure. (Lines With Other Classes and Within This Class)
- 315, Electric Lamp and Discharge Devices: Systems. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 318, Electricity: Motive Power Systems. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 320, Electricity: Battery or Capacitor Charging or Discharging. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 322, Electricity: Single Generator Systems. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 323, Electricity: Power Supply or Regulation Systems. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 324, Electricity: Measuring and Testing. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 333, Wave Transmission Lines and Networks. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 338, Electrical Resistors, especially subclass 209 for extensible resistors, subclasses 210+ for flexible or folding resistors, including subclass 214 for cable type resistors, subclasses 226+ for incased, embedded or housed resistors, subclass 321 for resistance element cores and frames which may be of insulating material, and subclass 322 for resistors with terminals. See Lines With Other Classes, "Conduits, Cables, and Conductors With Resistive Material" and "Resistance Components and Sub-combinations" in the class definition under Class 338 for certain classification lines relating to this subject matter. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 340, Communications: Electrical. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 343, Communications: Radio Wave Antennas, subclasses 700+ for antennas. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 361, Electricity: Electrical Systems and Devices. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 363, Electric Power Conversion Systems. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 373, Industrial Electric Heating Furnaces. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 375, Pulse or Digital Communications, subclass 36 for cable systems and components. (See Class Definition, above.)
- 375, Pulse or Digital Communications, subclass 257 for cable systems and components. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 379, Telephonic Communications subclasses 90.01+ and indented subclasses having composite electrical systems and subclass 415 and indented subclasses having anti-inductive systems. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 404, Road Structure, Process, or Apparatus, subclass 3, 4+, and 17+ for conduits combined with pavement, curb or gutter structure and not limited solely to electrical use. (Lines With Other Classes, "Conduits")
- 405, Hydraulic and Earth Engineering, subclasses 132+, for tunnels and subways not restricted solely to electrical use. (Lines With Other Classes, "Conduits")
- 423, Chemistry of Inorganic Compounds, appropriate subclasses for compounds and compositions which are dielectrics, and their manufacture. (See Lines With Other Classes, "Miscellaneous," above.)
- 427, Coating Processes, subclasses 58+ for coating processes, per se, wherein an electrical product is produced.
- 428, Stock Material or Miscellaneous Articles, appropriate subclasses, for stock material, particularly in plural layer form, which may be

- disclosed as having the property of electrical conductivity or insulation. (Lines With Other Classes, "Conductors and Electrical Systems")
- 428, Stock Material or Miscellaneous Articles, subclasses 544+ for conductors which are no more than metal stock, even though claimed as being electric conductors. (Lines With Other Classes, "Miscellaneous")
- 429, Chemistry: Electrical Current Producing Apparatus, Product and Process. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 439, Electrical Connectors. (See Lines With Other Classes, "Conductors and Electrical Systems")
- 501, Compositions: Ceramic, appropriate subclasses for ceramic compositions useful as electrical insulator. (Lines With Other Classes, "Miscellaneous")
- 520, Synthetic Resins or Natural Rubbers, appropriate subclasses. (Lines With Other Classes, "Miscellaneous")
- 523, Synthetic Resins or Natural Rubbers, subclass 173 for a composition containing a synthetic resin having utility as a filling or flooding composition for cables or to processes of preparing said composition. (Lines With Other Classes, "Miscellaneous")
- 585, Chemistry of Hydrocarbon Compounds, appropriate subclasses for compounds and compositions which are dielectrics, and their manufacture. (See Lines With Other Classes, "Miscellaneous," above.)

SUBCLASSES

- 1** This subclass is indented under the class definition. Structures not provided for in the following subclasses.
- 2** This subclass is indented under the class definition. Structures for protecting life and/or property from atmospheric electrical discharges, due to either a direct stroke or due to induction from the discharge.
- (1) Note. For related subject matter in this class, see Search This Class, Subclass, below.
- (2) Note. Where significant structure of the device protected is claimed, in addition to that necessary to define the lightning

protective means, the classification is with the device, with a cross-reference here.

- (3) Note. Art structures made of conductive and/or insulative materials are with the appropriate art, even though claimed to be for lightning protective purposes.
- (4) Note. Collection of atmospheric electricity is elsewhere. See the Search Class notes below.
- (5) Note. Protection of electrical equipment from electrical disturbances including over-voltage is with the appropriate art even though the disturbance is disclosed and claimed as due to lightning. See the Search Class notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 4, for air terminals.
- 5, for electric shock hazard protective devices not specialized to lightning protection.
- 6, and 7, for Earth grounds, per se.
- 32, and indented subclasses for anti-inductive structures.
- 48, and 49 for building structures combined with conductors, not specialized to lightning protection, subclasses.
- 73.1, for conduit, cable and conductor joint and end structures with conductive stress distributing means.
- 102, and indented subclasses for conductors with conductive armors or sheaths.
- 110, and indented subclasses for insulated conductors.
- 126.1, and indented subclasses for conductor structure, per se.
- 140, and indented subclasses for insulators with conductive arcing or stress distributing means.

SEE OR SEARCH CLASS:

- 178, Telegraphy, subclass 69 for telegraph line clearing and circuit maintenance.
- 256, Fences, subclass 10, for fences constructed to be electrically charged.
- 310, Electrical Generator or Motor Structure, subclass 308 for collection of atmospheric electricity.

- 324, Electricity: Measuring and Testing, subclass 110 for electric meter protection.
- 361, Electricity: Electrical Systems and Devices, subclasses 1+ for miscellaneous safety systems for protecting electrical apparatus and subclasses 61+ for lightning arresters; subclasses 212+ for discharging of static charges.
- 379, Telephonic Communications, subclass 415 for anti-inductive telephone systems;
- 3** This subclass is indented under subclass 2. Structures claiming only lightning rod conductor structure. The complete rod includes its appurtenances, such as the air terminal at one end, grounding means at the other end, mounting devices, etc.
- (1) Note. Systems of lightning rods and lightning rods claimed in combination with the device protected are elsewhere in this class.
- (2) Note. Conduit, cable and conductor structure of general application and for conductor structure, per se, including that claimed as lightning rods, are elsewhere in this class.
- (3) Note. For conductor supports, for a supporting device having means for receiving a staff, and for pipe or cable supports, see the search notes below.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 2, for systems of lightning rods and lightning rods claimed in combination with the device protected
- 68.1+, for conduit, cable and conductor structure of general application,
- 126.1+, for conductor structure, per se, including that claimed as lightning rods.
- 137+, for conductor supports.
- SEE OR SEARCH CLASS:
- 248, Supports, particularly subclasses 511+, for a supporting device having means for receiving a staff, and subclass 49 and indented subclasses, for pipe or cable supports.
- 4** This subclass is indented under the class definition. Structures of conductor air terminals and combinations thereof with subject matter .
- (1) Note. These are mostly disclosed with relation to lightning protection systems in this class.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 2, 3, for lightning protection systems.
- SEE OR SEARCH CLASS:
- 343, Communications: Radio Wave Antennas, subclasses 700+, for radio antenna construction, see Class
- 5** Miscellaneous structures for protecting persons or animals against electrical shock. Included, for example, are (1) covers or guards adapted to be positioned about a charged conductor or other electrical equipment for preventing accidental contact therewith; (2) devices for insulating the body of a person or animal from ground; and (3) devices forming a shunt path from a charged conductor to ground in the event of accidental contact therewith.
- (1) Note. This subclass does not take mere sheathed or insulated wires or cables, nor conductors which are installed in conduits, for which see this class, subclass 68.1 and indented subclasses; but short lengths of insulation tubes or sleeves adapted to be positioned about an exposed position of conductor to prevent contact therewith by persons or animals are here.
- (2) Note. Protective devices of the character provided for here, but limited by structure to use with specific electric apparatus, are classified in the appropriate apparatus class.
- (3) Note. For art structure, in general, formed in whole or in part of insulating material or otherwise constructed to protect the wearer or user against electrical shock, see the appropriate art class.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 2, 3 for protection of life and/or property against lightning.
- 37+, 50+ for mere manholes, boxes or casings for housing electrical apparatus.
- 136, for conduit, cable or conductor anti-abrasion devices.
- 137+, for insulators not limited to use as shock-hazard protective devices, see this class, subclass
- 138, for electrically insulated pull chains for switches.

SEE OR SEARCH CLASS:

- 2, Apparel, for art structure, in general,
- 81, Tools, for art structure, in general.
- 361, Electricity: Electrical Systems and Devices, subclasses 212+ for discharging static electricity.
- 191, Electricity: Transmission to Vehicles, subclass 30, 31 and 35, for protected third rails and guarded trolley conductors.
- 294, Handling: Hand and Hoist-Line Implements, subclass 19 and indented subclasses for devices for temporarily holding and handling conductors while insulators are being changed.
- 16, Miscellaneous Hardware, subclasses 431+ for insulated handles.
- 439, Electrical Connectors, appropriate subclasses for connector coupling devices having insulation or barrier means to prevent contact with the "live" parts thereof,
- 200, Electricity: Circuit Makers and Breakers, subclass 51.09 for such devices having automatic means for deenergizing the contacts upon separation of the coupling parts.

- 6** This subclass is indented under the class definition. Structures having means specially designed to make intimate contact with the earth to establish electrical connection between a conductor and the earth.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 37+, for underground installations of conductors other than earth grounds.

- 51, for devices in this class involving means for establishing electrical connection between a box or housing and a grounded conductor.
- 78, for conduit, cable, and conductor structures having end structure combined with grounding means, see this class, subclass 78.

SEE OR SEARCH CLASS:

- 52, Static Structures (e.g., Buildings), subclasses 146+, 153+, 155+, and 292+ for earth anchors or shafts, e.g., poles with anchors or bases, not limited to use as earth grounds.
- 204, Chemistry: Electrical and Wave Energy, subclasses 196.01+, especially subclasses 196.21 and 196.36 earth grounds employed with means for applying an electrical current or potential to prevent corrosion, scale formation or other objectionable action upon an object which may be placed upon or within the ground.
- 343, Communications: Radio Wave Antennas, subclasses 829+, 845 and 846+ for antennas with a ground connection or grounding structure.
- 439, Electrical Connectors, subclasses 92+ for an electrical connector with circuit conductors and safety grounding provision; and subclasses 207+ for an electrical connector combined with a conduit or duct therefor.

- 7** This subclass is indented under subclass 6. Structures having a portion so formed as to permit it to be readily driven into the earth.

- 8** This subclass is indented under the class definition. Structures in which a vacuum or fluid is employed or having means peculiarly adapted for use in connection with a vacuum or with material in a fluid condition.

- (1) Note. In the subject matter for this class, all spaces are subject to being filled with insulating material in a fluid or solid condition. Thus when the claims define structure which will provide such space, classification will be made in subclasses 8+ only when the claims are limited to the use of fluid or presence of a vacuum and/or are limited to structure which will

have its intended function because of the use of materials in fluid condition or the presence of a vacuum. This principle is further stated in particular Notes to the indented subclasses.

- (2) Note. Even though the material is disclosed as being of a character which will subsequently harden, if the means claimed provides for using or handling such material in a fluid condition, it is in this subclass or the indented subclasses. The fluid may be in any state, i.e., a liquid, gas, or vapor.
- (3) Note. Where the sole fluid is the atmosphere exterior to the device, it is excluded, even though means to seal or otherwise keep moisture or air out is claimed.
- (3.5) Note. See Lines With Other Classes, 1., and "Housing, Boxes or Receptacles" of the class definition for the subject matter included in this and the indented subclasses. Note that this and the indented subclasses include housings and envelopes for electric lamps, electric space discharge devices and similar devices which are within the class and subclass definition. See especially indented subclasses 9, 15.1+, 17+ (see 17.05+ for the hermetically sealed envelopes and housings) and subclass 31. Note that merely stating that the housing or envelope is for a vacuum or gas filled tube will not cause classification in this or the indented subclass even though hermetic seals for the housing or envelope are claimed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 47, for fluid conveying conduits combined with conductors.
- 101.5, for gas filled or vacuum spaces to merely make conduit or cable structures buoyant.
- 118, for the use of powdered or granular material in insulated cables.
- 126.1+, for bare conductors made of single or plural wires.

- 211, for the exterior formation of insulators to dispose of rain or atmospheric moisture.

SEE OR SEARCH CLASS:

- 137, Fluid Handling, for fluid handling devices in general, particularly subclass 375.
- 218, High-Voltage Switches With Arc Preventing or Extinguishing Devices, subclasses 1+ for switches utilizing arc extinguishing fluids.
- 313, Electric Lamp and Discharge Devices, subclasses 11+ provides for electric lamps and electric space discharge devices which are provided with means for modifying the temperature of the lamp or discharge device (including such devices where a fluid is used as the temperature modifying medium), subclasses 567+ provides for lamps and discharge devices which have an envelope containing a gas or vapor, subclasses 231.01+ provides for discharge devices having means for introducing a fluent material to the discharge space and for lamps and discharge devices having means for directing the flow of fluent material in the lamp or discharge device.
- 333, Wave Transmission Lines and Networks, subclasses 219+ for resonators (e.g., cavity type) and subclasses 236+ for long lines (e.g., wave guide type) in which a vacuum, gas or fluid is employed.
- 336, Inductor Devices, provides in subclasses 55+ for transformer and inductive reactor structure with means to modify the temperature of the structure (including where a fluid is used as a temperature modifier).

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This subclass is indented under subclass 8. Structures in which a fluid designed to carry an electric current is utilized; or in which a vacuum is employed for any purpose.

- (1) Note. This subclass includes devices within the class definition having as a part thereof an electric conductor formed by a fluid (e.g., mercury).

SEE OR SEARCH CLASS:

- 200, Electricity: Circuit Makers and Breakers, subclass 32, 81.6 and 152 for electric circuit makers and breakers in which contact is made through a conducting fluid, usually mercury.
- 220, Receptacles, subclasses 2.1+ for envelopes and housings which are designed to be evacuated for electric lamps, electric space discharge devices and similar devices where no electrical structure is claimed.
- 313, Electric Lamp and Discharge Devices, appropriate subclasses for electric space discharge devices which have an evacuated or gas or vapor filled envelope and in which a part of the current path is the evacuated or gas or vapor filled space, and subclass 233 and 315+ for electric lamps which are provided with an evacuated envelope.
- 335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclasses 47+ for electromagnetically activated switches in which contact is made through a conductive fluid.
- 337, Electricity: Electrothermally or Thermally Actuated Switches, subclass 21 for electrothermal or thermal switches employing conductive fluid, subclasses 25+ for such switches combined with electric discharge means and subclasses 28+ for similar switches combined with space discharge devices.

- 10** This subclass is indented under subclass 8. Cables and conduits having means associated therewith intended to be used only prior to or during installation of the device, as during shipment or storage.

SEE OR SEARCH CLASS:

- 254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 134.3+ for conductors not having significant electrical features and cables in combination with wire-placing means, see Class

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This subclass is indented under subclass 8. Structures including (1) means responsive to some condition of the fluid (for example, temperature, pressure or flow) to operate some device (for example, valves, switches or indicators), (2) also all combinations with signaling or indicating means, including liquid level gauges.

- (1) Note. Fluid pressure operated valves are included.
- (2) Note. This subclass does not include mere expansion and contraction devices which compensate for changes in volume of the fluid, unless associated with fluid controlled or indicating means. Such expansion and contraction devices are elsewhere in this class.
- (3) Note. For signaling means and means responsive to a condition of a fluid, and not limited to combination with subject matter of this class (174), see the appropriate class, the following in Search Class, below, being particularly noted.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclasses 40+, for means for detecting leaks in electrical apparatus utilizing fluids where the structural characteristics of the electrical apparatus are not claimed.
- 116, Signals and Indicators. (See Note (3), above.)
- 137, Fluid Handling, particularly subclasses 455+ and 551+. (See Note (3), above.)
- 138, Pipes and Tubular Conduits, particularly subclasses 26+. (See Note (3), above.)
- 220, Receptacles, particularly subclasses 721+. (See Note (3), above.)
- 236, Automatic Temperature and Humidity Regulation. (See Note (3), above.)
- 313, Electric Lamp and Discharge Devices, subclass 13 for electric lamps and discharge devices with nonelectrical means for controlling the temperature modifying medium used with the lamp or discharge device.

- 315, Electric Lamp and Discharge Devices: Systems, subclasses 112+ for electric lamps and discharge devices with electrical means for controlling the temperature modifying medium used with the lamp or discharge device.
- 340, Communications: Electrical, appropriate subclasses. Note particularly subclasses 577+, 584+, 603+, and 635+. (See Note (3), above.)
- 361, Electricity: Electrical Systems and Devices, subclass 14 for miscellaneous electrical systems having fluid condition response means for controlling the system for safety purposes (e.g. opening supply circuit if cooling medium is not effective).
- 374, Thermal Measuring and Testing, particularly subclass 152. (See Note (3), above.)
- 12** This subclass is indented under subclass 8. Structures including means providing for expansion and contraction of the fluid.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
11, to complete the search.
- SEE OR SEARCH CLASS:
92, Expandable Chamber Devices, appropriate subclasses for an expandable chamber device, and particularly subclasses 34+ for a bellows type expandable chamber device, and subclasses 89+ for a collapsible chamber type expandable chamber device.
- 138, Pipes and Tubular Conduits, subclasses 26+, for pressure compensators for pipes and tubular conduits.
- 220, Receptacles, subclasses 720+ and indented subclasses, for accessory means providing for expansion in a receptacle not limited to electrical apparatus.
- 13** This subclass is indented under subclass 12. Structures embodied in or constituting part of the structure of a conduit or cable.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
24+, for fluid containing conduit and cable structures not involving expansion and contraction means.
68.1+, for conduit and cable structures not involving fluids.
- 14** This subclass is indented under subclass 8. Structures having means for preserving or maintaining the character of the fluid. For example, this includes means for drying gases, dehydrating liquids, and all forms of chemical or physical treatment of the fluid other than mere cooling, fluid feeding, circulating or distributing which is in this class, subclasses 15.1 and 16.
- (1) Note. Electrical equipment containing fluid dielectrics having a preservative ingredient as the sole preserving means are not in this subclass but in subclass 8 or other appropriate indented subclass.
- (2) Note. For processes, compositions and apparatus for purifying materials, not limited to combination with subject matter for this class, see the appropriate class.
- SEE OR SEARCH CLASS:
95, Gas Separation: Processes, for processes, compositions and apparatus for purifying materials, not limited to combination with subject matter for this class (174).
96, Gas Separation: Apparatus, for processes, compositions and apparatus for purifying materials, not limited to combination with subject matter for this class (174).
137, Fluid Handling, subclasses 455+ pipes and other fluid handling devices combined with means responsive to a change in the conditions in the line for maintaining or correcting the condition.
191, Electricity: Transmission to Vehicles, subclass 27, for heated conduits restricted to the purpose of that class.
210, Liquid Purification or Separation, especially subclass 243, for electrical insulating or electricity discharging

- means which is ancillary to a separator and subclasses 167+ for separators in a closed circulating system for an art device not provided for elsewhere; and
- 252, Compositions, has fluid dielectric compositions containing preservative ingredients.
- 261, Gas and Liquid Contact Apparatus, for processes, compositions and apparatus for purifying materials, not limited to combination with subject matter for this class (174).
- 313, Electric Lamp and Discharge Devices, subclasses 545 through 566 for electric lamps and electronic tubes which are provided with a getter or gas or vapor generating material to preserve, maintain, or used to secure a desired vacuum or gas or vapor atmosphere within the envelope of the device.
- 15.1 With cooling or fluid feeding, circulating or distributing:**
This subclass is indented under subclass 8. Subject matter combined with means for feeding, circulating or distributing a fluid or with means for cooling either the fluid or the apparatus.
- (1) Note. See Lines With Other Classes, above, section 1., for the lines between this subclass, other subclasses in this class, and elsewhere for housings and envelopes for electrical devices.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
11, for subject matter including a fluid condition responsive means for initiating an operation of a device.
- SEE OR SEARCH CLASS:
62, Refrigeration, appropriate subclasses for material and space refrigerating processes and apparatus, particularly subclass 259.2 for cooling of an electrical component.
165, Heat Exchange, appropriate subclasses for miscellaneous heat transfer apparatus including boxes or housings in combination with means to modify their temperature.
- 257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses for active solid-state semiconductor devices, per se, especially subclass 468 for cryogenically cooled active semiconductor devices, and subclasses 714-716 for liquid cooled active semiconductor devices.
- 313, Electric Lamp and Discharge Devices, subclasses 11+ for such devices provided with means to modify their temperature.
- 336, Inductor Devices, subclasses 55+ for such devices provided with means to modify their temperature.
- 338, Electrical Resistors, subclasses 51+ and 53+ for electrical resistors provided with cooling or heat dissipating means.
- 361, Electricity: Electrical Systems and Devices, subclasses 274.1+ and 276 for electrostatic capacitors provided with cooling or heat dissipating means, and subclasses 379 and 381+ for cooling of electrical and electronic components.
- 439, Electrical Connectors, subclasses 190+ for electrical connectors provided with cooling or ventilating means.
- 15.2 By heat pipe:**
This subclass is indented under subclass 15.1. Subject matter wherein cooling is provided by means of a heat-transfer device consisting of a sealed metal tube with an inner lining or wick-like capillary material and a small amount of fluid which undergoes a change of state.
- SEE OR SEARCH CLASS:
165, Heat Exchange, subclasses 104.11+ for structure of heat pipes, per se.
- 15.3 For bushing or pothead:**
This subclass is indented under subclass 15.1. Subject matter for (a) a through wall insulator (bushing) or, (b) a form of terminal sealed to the sheath of an electrical cable for making a moisture-proof connection with an external cable or conductor (pothead).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

11, 12, 14, 18, 19, 20, 74+, 142+, 151+, and 167 for structure of bushings and potheads (high potential end terminals) not involving cooling.

15.4 Superconductive type:

This subclass is indented under subclass 15.1. Subject matter including conductors which exhibit nearly no resistance at very low temperature.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclass 99 for such devices with superconductive features.
335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclass 216 for such devices with superconductive features.
336, Inductor Devices, Digest 1 for other inductors with superconductive features.
505, Superconductor Technology: Apparatus, Material, Process, particularly subclasses 230+ for high temperature (greater than 30 K) superconducting wire, tape, cable, or fibers, and art collection subclass 885 for superconductors operating at or below 30 K.

15.5 For cable, conductor or joint:

This subclass is indented under subclass 15.4. Subject matter wherein a cryogenic fluid is applied to a cable, a conductor or a joint between two or more conductors.

- (1) Note. This subclass provides for superconductive cables, conductors or joints wherein a means for cooling or some feature particularly adapting the device for use with a cryogenic cooling fluid is included.
- (2) Note. Subject matter classifiable in this subclass should not be cross referenced in subclass 125.1 of this class.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

84+, for joints between superconductive cables or conductors when no cooling feature is specified.
125.1, for superconductive cables or conductors which do not include a means for cooling.

SEE OR SEARCH CLASS:

428, Stock Material or Miscellaneous Articles, subclass 930 for superconductive stock material.

15.6 For cable, conductor or joint:

This subclass is indented under subclass 15.1. Subject matter wherein a cryogenic fluid is applied to a cable, a conductor or a joint between two or more conductors.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

68+, for such devices which do not include cooling features.

15.7 For welding or furnace cable:

This subclass is indented under subclass 15.1. Subject matter where the cooling fluid is applied to a cable used in a welding or furnace application.

SEE OR SEARCH CLASS:

219, Electric Heating, subclass 137.9 for welding apparatus combined with cooled current supply cables.

16.1 By ventilation or gas circulation:

This subclass is indented under subclass 15.1. Subject matter in which means are provided for ventilating a chamber or space containing gas or for circulating a gas therethrough.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

87, for insulators having apertures connecting interior space with the atmosphere.

SEE OR SEARCH CLASS:

34, Drying and Gas or Vapor Contact With Solids, appropriate subclass for apparatus for drying conductors and

- insulators not built in as part of the structure thereof.
- 361, Electricity: Electrical Systems and Devices, subclasses 382+ for cooling of plural electrical components by air or other gas.
- 454, Ventilation, appropriate subclass for ventilation of general application.
- 16.2 Of bus bars or bus ducts:**
This subclass is indented under subclass 16.1. Subject matter for ventilating bus bars or bus ducts or circulating gas through or around bus bars or bus ducts.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
68.2, for patents having bus bars and bus ducts.
- 16.3 With heat sink:**
This subclass is indented under subclass 16.1. Subject matter including a conductive heat transfer device, e.g., a "heat sink", to conduct heat from the object being cooled to the air or other gaseous cooling medium.
- SEE OR SEARCH CLASS:
165, Heat Exchange, subclass 80.3 and 185 for the structure of heat sinks, per se, not involving any electrical feature.
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses for active solid-state semiconductor devices, per se, especially subclass 468, 625, 675, 706, 707, and 712-722 for such devices with cooling means.
361, Electricity: Electrical Systems and Devices, subclasses 386+ for heat sinks associated with plural electrical components.
- 17** This subclass is indented under subclass 8. Structures, other than conduits, for housing electrical devices or apparatus.
- (1) Note. For manholes, boxes and housings not limited to use with fluids, see this class, subclass 37 and indented subclasses, and 50 and indented subclasses, and the notes thereunder.
- (2) Note. This subclass does not include conduit or cable end structures or joints, for which see this class, subclasses 19, 20, 21, and 22.
- (3) Note. See section 7 of the class definition for housings and envelopes for electric lamps and electric space discharge devices included in this subclass.
- (4) Note. Search Class 220, Receptacles subclasses 2.1+ for envelopes and housings for electric lamps and electric space discharge devices where no electrical structure is claimed. Search Class 313, Electric Lamp and Discharge Devices, appropriate subclasses for electric lamps and electric space discharge devices which are provided with an envelope, jacket or housing. See especially subclass 324 and the subclasses specified in the Notes thereto. Also, see section 7 of the class definition of Class 174.
- 17.05** This subclass is indented under subclass 17. Boxes, housings and envelopes which are hermetically sealed.
- (1) Note. Merely reciting that the envelope is provided with structure (such as the hermetic seals) to provide a hermetically sealed envelope for use with a vacuum or gas filling will not cause classification in this or the indented subclasses. See subclasses 50.5+ for such hermetically sealed envelopes.
- (2) Note. Many of the envelopes and housings in this and the indented subclasses are of the type used for electric lamps, electric space discharge devices, and similar electrical devices. See section 7 of the class definition.
- (3) Note. This and the indented subclasses provide for envelopes and housings which have an evacuating stem or opening.
- (4) Note. Most of the boxes, housings and envelopes in this and the indented subclasses are provided with lead-in conductors for conducting electrical energy

to the device within the box, housing or envelope.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 9, for this subject matter where the structure includes a current conductive fluid (e.g., a liquid used as part of the lead-in structure) or where a vacuum is used (e.g., as a space around the lead-in designed to be continuously evacuated to reduce leakage of air or gas).
- 14, for this subject matter where the structure includes means for preserving or maintaining the character of the fluid used with the box or housing.
- 15.1, for this subject matter where the structure includes means for circulating, feeding or distributing a fluid or is provided with fluid type cooling means for the box or housing or the device therein.
- 50.5+, and the subclasses specified in the Notes thereto for the miscellaneous hermetically sealed boxes and housings in this class including those with lead-in conductors.

SEE OR SEARCH CLASS:

- 220, Receptacles, subclasses 2.1+ for envelopes and housings for electric lamps and electric space discharge devices where no electrical structure is claimed, see indented subclass 2.2 for such envelopes and housings as are provided with an evacuating stem or opening.
- 313, Electric Lamp and Discharge Devices, appropriate subclasses for electric lamps and electric space discharge devices which are provided with an envelope or a housing. See especially subclasses 317+ of Class 313 and the subclasses specified in the Notes thereto. Also see section 7 of the class definition of Class 174.

- 17.06** This subclass is indented under subclass 17.05. Subject matter in which a liquid is used to seal a joint of the box, housing or envelope.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 9, where the liquid is also used as an electric conductor (e.g., the liquid is used as a lead-in conductor).
- 31.5, for bushings, terminals and lead-ins with liquid sealed joints even though the wall or plate of the supporting box or housing for the bushing, terminal or lead-in is claimed where no characteristics of the box or housing are claimed.

SEE OR SEARCH CLASS:

- 220, Receptacles, subclass 228 for receptacles having liquid sealed closures and see the classes referred to in the Notes to that subclass for other classes which provide for structures with liquid sealed joints.

- 17.07** This subclass is indented under subclass 17.05. Subject matter wherein the box, housing or envelope is provided with an evacuating stem formed of conductive material which is also used as a lead-in conductor for conducting electrical energy to the device within the box, housing or envelope.

- (1) Note. This subclass does not include boxes, housings or envelopes where a solid lead-in conductor merely passes through a nonconductor (e.g., glass) evacuating stem.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 9, where the lead-in conductor is a liquid which is also used to seal a joint so as to make the joint fluid tight.

- 17.08** This subclass is indented under subclass 17.05. Subject matter in which the box, housing or envelope has an electrical connector combined therewith for connecting a lead-in conductor of the box, housing or envelope to an external conductor, or where the envelope, box or housing has a portion thereof formed as to be at least a part of an electrical connector.

- (1) Note. This subclass includes hermetically sealed envelopes such as used for electric lamp, electric space discharge

devices and similar devices which are provided with a screw type or plug type base as well as boxes, housings and envelopes where the lead-in conductors are either shaped so as to form electrical connectors or are of sufficient rigidity to form contacts (usually plug type contacts) subject to the limitations of (2) Note. It also includes devices where a portion of the enclosing wall of the envelope is shaped so as to form an electrical connector.

- (2) Note. This subclass provides for the structure of the box, housing or envelope with connector structure where significant structure of the housing, box or receptacle is recited in addition to that necessary to support or mount the electrical connector. See section 17.5 of the class definition of this class (174). See Class 439, Electrical, Connectors, appropriate subclasses for electrical connector structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

50.52+, for other hermetically sealed envelopes, boxes and housings in this class which are provided with an electrical connector.

SEE OR SEARCH CLASS:

313, Electric Lamp and Discharge Devices, subclasses 318.01+ and the subclasses specified in the Notes thereto for electric lamps and electric space discharge devices which have a hermetically sealed envelope with an electrical connector (e.g., base) thereon or formed as a part thereof.

- 18** This subclass is indented under subclass 17. Boxes and housings having bushing or terminal means specially modified for cooperation with the structure of the housing or with some device or fluid contained therein.

- (1) Note. Inventions under subclass 8 relating merely to the mounting of a bushing or terminal in a wall or plate are in this class, subclass 31, even though the wall or plate is disclosed or claimed as a box or housing where no characteristics

thereof, such as its structure or contents, are claimed.

- (1.5) Note. Search this class, subclasses 17.05+ for hermetically sealed envelopes and housings under subclass 8 such as are used for electric lamps and electric space discharge devices and which are provided with lead-in conductors for transmitting electrical energy through the wall of the envelope or housing.

- 19** This subclass is indented under subclass 8. Structures at the end of a conduit, cable or conductor for terminating the same, and commonly known as potheads or terminals. These devices have means for engagement with the sheath or conduit at or near the end thereof and provide means either to lead the conducting element or elements to the exterior of the device or provide electrical connection between the interior conductors and the exterior of the device.

- (1) Note. For such structures not involving fluids, see this class, subclasses 60, 73.1, and 74 and indented subclasses, and the notes thereunder.

- 20** This subclass is indented under subclass 19. End structure having means for isolating the fluid in the conduit or cable from a fluid in the terminal housing or casing.

- (1) Note. For other fluid stops and seals, see this class, subclasses 22 and 23.

- 21** This subclass is indented under subclass 8. Structures for joining electrically and/or mechanically two or more conduits, cables or conductors.

- (1) Note. For nonfluid cable or conduit joints see this class, subclasses 73.1 and 84 and indented subclasses, and the notes thereunder.

- (2) Note. See Class 156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 49 for methods of splicing indefinite length electric conductors.

- 22** This subclass is indented under subclass 21. Joints having means for preventing passage of fluid from one section to another.
- (1) Note. Compare this class, subclasses 20 and 23, for other fluid stops and seals.
- 23** This subclass is indented under subclass 8. Structures having means for preventing passage of fluid from one section to another or for sealing the ends or outlets to prevent fluid leakage.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
- 10, for a conduit or cable using or adapted to use a vacuum or fluid having a temporary sealing device for use during transportation or storage.
- 20, for a conduit or cable end structure using or adapted to use a vacuum or fluid including a seal.
- 22, for a conduit or cable joint using or adapted to use a vacuum or fluid including a seal.
- SEE OR SEARCH CLASS:
- 138, Pipes and Tubular Conduits, subclasses 89+ for a plug or closure for a pipe or tubular conduit.
- 156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 48 for a method of making a conductor of indefinite length including filling a void or cavity with fluent material.
- 277, Seal for a Joint or Juncture, for a generic sealing means or process, subclasses 602+ for a static contact seal intended for use on a pipe, conduit or cable.
- 24** This subclass is indented under subclass 8. Structures pertaining to the makeup of electric cables or conductors, insulated or uninsulated, and of the conduits therefor, including the arrangement of the wires or cables therein.
- (1) Note. Where the sole fluid is air under atmospheric conditions, this subclass takes those patents dealing with arrangements to provide air spaces for a particular purpose. Plural conductors or cables
- spaced within a conduit or sheath with or without means for maintaining them in spaced relation are in this class, subclass 68.1 and indented subclasses.
- (2) Note. This subclass and the indented subclasses take such structure having means for handling or introducing fluid materials or permitting their flow in fluid condition, and also such structure where the material claimed is fluid under conditions of use. All other patents on such structure which claim a material which is solid in condition of use (even though applied during manufacture in fluid condition) or which claim material in broad terms not limited to being fluid in condition of use, are in this class, subclass 68.1 and indented subclasses.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
- 2, 3 for lightning protection means employing fluids.
- 6, 7, for earth grounds employing fluids.
- 47, for conduits having both electrical conductor channels and separate fluid channels.
- 101.5, for buoyant conduits, cables and conductors.
- 126.1+, for mere bare hollow conductors.
- SEE OR SEARCH CLASS:
- 191, Electricity: Transmission to Vehicles, subclass 26 for third rail or trolley wire conduits having draining means.
- 25** This subclass is indented under subclass 24. Structures of the type in which the conductor insulating material is impregnated with a fluid.
- (1) Note. For conduit, cable or conductor structures where an impregnant is claimed generally or is limited to the type that solidifies under conditions of use, see this class, subclasses 96, 98, 102, and indented subclasses, 110 and indented subclasses, particularly subclass 121.
- 26** This subclass is indented under subclass 25. Structures having more than one conductor.

- (1) Note. See this class, subclasses 103, 104 and 113 and indented subclasses.
- 27** This subclass is indented under subclass 24. Structures having a plurality of conductors at least two of which are arranged in substantially parallel or twisted relation.
- (1) Note. "Parallel" is used in this definition to exclude the concentric or coaxial type in this class, subclasses 28 and 29, but a combination of these is in this subclass (27).
- (2) Note. See this class, subclass 26, and the notes thereunder.
- 28** This subclass is indented under subclass 24. Structures having at least one conductor surrounded by and spaced from the inner walls of a tube or conduit which tube or conduit may be of either conducting or nonconducting material.
- (1) Note. For similar structures having plural parallel or twisted conductors (not arranged in surrounding relation), see this class, subclass 27.
- (2) Note. For similar structures having solid insulation filling the space, see this class, subclasses 96, 98, 102, and indented subclasses and 111.
- (3) Note. For conduits having interior conductor supporting means, see this class, subclasses 99 and 100.
- 29** This subclass is indented under subclass 28. Cables in which a central inner element is spaced from an outer concentric element by spirally-applied spacing means.
- (1) Note. See this class, subclass 131.
- SEE OR SEARCH CLASS:
428, Stock Material or Miscellaneous Articles, subclass 592 for metallic stock of helical configuration or having a helical component.
- 30** This subclass is indented under subclass 8. Structures for electrically insulating at least two objects from each other or an object from ground.
- (1) Note. For similar devices not involving the use of fluids, see this class, subclass 137 and indented subclasses. Patents claiming fluid tight joints between various parts of the insulator assembly, where the structure otherwise could be used with solid materials only, are placed in such subclasses.
- (2) Note. See Note (8) to the definition of subclass 8 of this class.
- 31** This subclass is indented under subclass 30. Structures (1) having a passage arranged substantially axially thereof for receiving a conductor or other element to be insulated, and/or (2) for insulating a conductor or other object from a wall or plate through which the conductor or other object passes. Such devices are commonly known as bushings, terminals, and lead-ins.
- (1) Note. The search should be continued in this class, subclass 18.
- (2) Note. For similar devices not limited to use with fluids, see this class, subclasses 142, 143, 151, and indented subclasses, 154, 155, 156, 157, and 167. Merely claiming a fluid tight structure (such as having a fluid tight joint) will not cause classification in this subclass (31) where there is no other structure claimed which is especially provided for use with a fluid. A structure which provides a chamber to contain a fluid will be classified in this subclass (31).
- (3) Note. See conduit and cable end structures, this class, subclasses 19, 20 and 74 and indented subclasses, particularly subclass 75, for related structures where one end of the insulator structure engages the sheath or conduit (conductive or insulative) surrounding the conductors at or near the end thereof.

- (4) Note. Search Class 313, Electric Lamp and Discharge Devices, subclass 120 for spark plugs having fluid feed or air vent means. This class (174) provides for spark plugs with such vents when the sparking electrodes are not claimed (i.e., when only the bushing and vent structure is claimed).
- 31.5** This subclass is indented under subclass 31. Subject matter in which a liquid is used to seal a joint of the structure.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
17.06, for hermetically sealed envelopes, boxes, and housings, within the definition of subclass 9 including those with bushings, terminals and lead-ins, in which a liquid is used to seal a joint.
- SEE OR SEARCH CLASS:
220, Receptacles, subclass 45 for receptacles having liquid sealed closures and see the classes referred to in the Notes to that subclass for other classes which provide for structures with liquid sealed joints.
- 32** This subclass is indented under the class definition. Structures having means for preventing or reducing the detrimental effects due to either self-inductance of a single conductor or mutual inductance between plural conductors.
- (1) Note. Where the only anti-inductive means is constituted by one or more surrounding conduits or sheaths or conduit partition walls of conductive material, classification is in this class, subclass 68.1 and indented subclasses, particularly subclass 102 and indented subclasses, in which subclasses the surrounding sheath may be a conductive coating. If shields or electrical means in addition to the conduit or cable structure are provided, they are in this subclass (32) or appropriate indented subclasses.
- (2) Note. Where only the physical structure of a single bare conductor, whether of single or plural strands, is claimed, it is in this class, subclass 126.1 and indented subclasses, even though anti-inductive characteristics are alleged in the claim.
- (3) Note. For conductor, cable and conduit structures having air-spaces or utilizing fluids, even though the structure is for anti-inductive purposes, see this class, subclass 24 and indented subclasses, especially subclasses 27, 28 and 29.
- (4) Note. Search appropriate classes for particular apparatus having anti-inductive means as a part thereof.
- (5) Note. For electrical systems having anti-inductive means, see the appropriate class, particularly Class 178, Telegraphy, subclasses 45, 49 and 69; Class 307, Electrical Transmission or Interconnection Systems, subclasses 89+; Class 333, Wave Transmission Lines and Networks, particularly subclass 12, for transmission line inductive interference reduction systems; and Class 340, Communications: Electrical, particularly subclasses 288+ and 310.07. Electrical conductors combined with condensers, reactors or resistors have been classified as electrical systems. Class 379, Telephonic Communications, subclass 415.
- SEE OR SEARCH CLASS:
313, Electric Lamp and Discharge Devices, subclass 342 for noninductive filaments for electric lamps and electric space discharge devices.
338, Electrical Resistors, subclasses 61+ for electrical resistors with inductance reducing means.
- 33** This subclass is indented under subclass 32. Structures claiming means by which conductors are transposed in relative position.
- (1) Note. For inductors with coils or windings having parallel connected conductors which are transposed, see Class 336, Inductor Devices, subclass 187.
- 34** This subclass is indented under subclass 33. Structures in which the conductors are associated together (1) in cable form or (2) in the same single or multi-duct conduit.

- (1) Note. Conduit and cable structures combined with transposition boxes are in this class, subclass 33.
- (2) Note. For multi-duct pipe or tubular conduit structures, per se, having the passages transposed, even though claimed as electrical conduits and even though claimed as made of dielectric, conductive or composite materials, search Class 138, Pipes and Tubular Conduits, subclasses 111+, and Class 285, Pipe Joints or Couplings, particularly subclasses 120.1+, especially subclass 132 for plural passage fittings with branches.
- (3) Note. For conduit, cable, or conductor structures having twisted conductors without reference to any anti-inductive feature, see this class, subclass 68.1 and indented subclasses, particularly subclasses 102 and 110 and their indented subclasses.

35 This subclass is indented under subclass 32. Means in which an electrical shield is used. Shields or screens, per se, not classifiable in other main classes, are here.

- (1) Note. Box and housing structures having added means for insuring good electrical contact between the body and closure, body and conduit, or cable sheath is in this and indented subclasses.
- (2) Note. See sections 1 and 7 of the Class Definition for limits to a combination of an envelope, box or housing such as are used for electric lamps, electric space discharge devices, and similar devices and an electrical shield and for such envelopes, boxes and housings which include an electric shielding means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 50+, for a mere box or housing structure that may include conductive material or have shielding properties.

SEE OR SEARCH CLASS:

- 66, Textiles: Knitting, subclass 202 for fabrics or articles involving selection of strands of a peculiar nature.
- 123, Internal-Combustion Engines, subclasses 146.5+ for shielded internal combustion engine ignition systems.
- 139, Textiles: Weaving, subclass 425 for metal being used in the texture of the fabric.
- 245, Wire Fabrics and Structure.
- 277, Seal for a Joint or Juncture, for a generic sealing means or process, subclass 919 for a seal including an electrical feature or subclass 920 for a seal including an electromagnetic shielding feature.
- 313, Electric Lamp and Discharge Devices, subclass 313 for an electrical shield or static charge distribution means, especially the Search Notes thereto for electric lamps and space discharge devices that are provided with shields or screens for the lamp or discharge device or some part thereof, and subclasses 326+ for the structure of shields which are limited by claimed subject matter to use with electric lamps or electric space discharge devices.
- 315, Electric Lamp and Discharge Devices: Systems, subclass 85 for an electric current and/or voltage supply system for an electric lamp and/or electric space discharge device of the gas or vapor ionization type, having radiation shielding means for the system.
- 330, Amplifiers, subclass 68 for a shielding means involving structure other than that of transformers per se and subclass 170 for a shielding means for interstage transformer coupling.
- 334, Tuners, subclass 85 for electrical tuners provided with shielding means.
- 336, Inductor Devices, subclasses 84+ for transformers and inductive reactors in combination with an electric or magnetic shielding means.
- 343, Communications: Radio Wave Antennas, subclasses 841+ for antennas with an electrical shield; subclass 851 for antennas with a coupling net-

- work which may be shielded for radiation suppression; and subclass 905 for antennas combined with a transmission line which may be shielded.
- 439, Electrical Connectors, subclasses 607+ for an electrical connector having or providing an inductive or capacitive shield.
- 455, Telecommunications, subclasses 300+ for shielded radio receivers.
- 36** This subclass is indented under subclass 35. Means in which the shielding means is applied to a conductor only.
- (1) Note. See Notes (1), (2) and (5) to the definition of subclass 32 of this class.
 - (2) Note. See this class, subclass 102 and indented subclasses, for conductors that are conductively armored or sheathed.
- 37** This subclass is indented under the class definition. Structures specialized for positioning underground.
- (1) Note. Manholes, i.e., underground work chambers, are in this subclass. Single manholes with radiating conduits or cables are in this subclass, but plural interconnected manholes are in subclass 38, and manholes combined with road or pavement structure are in subclass 39.
 - (2) Note. Such structures employing fluids or a vacuum are in this class, subclass 8 and indented subclasses.
 - (3) Note. See this class, subclasses 48 and 49, for wall mounted conduits or housings.
 - (4) Note. Mere box or housing structures are in this class, subclass 50 and indented subclasses.
 - (5) Note. Mere conduit or cable structures are in this class, subclass 68.1 and indented subclasses, end structure being in subclass 74 and indented subclasses, even though disclosed for use in manholes.
- (6) The classes noted in Search Class, below, have the structures there provided for when not restricted solely to electrical apparatus, even though electrical apparatus may be included as part of the combination.
 - (7) Note. Search Class 429, Chemistry: Electrical Current Producing Apparatus, Product, and Process, subclass 47 for a battery wherein a portion of the earth constitutes a part of the battery.
 - (8) Note. See Class 52 subclasses 169.1+ for particular constructions with a specified terranean relationship.
 - (9) Note. For underground transmission to vehicles, see Class 104, Railways, particularly subclass 140 and indented subclasses, and Class 191, Electricity: Transmission to Vehicles, particularly subclass 23 and indented subclasses.
- SEE OR SEARCH CLASS:
- 405, Hydraulic and Earth Engineering, subclasses 132+, for tunnels and subways. (See (6) Note, above.)
- 137, Fluid Handling, subclass 236, for fluid handling systems including geos:graphic feature, and subclasses 363+ for fluid handling devices including ground supports. (See (6) Note, above.)
- 138, Pipes and Tubular Conduits, subclass 105, for pipes in a trench; subclass 108 for underground conduits for supporting cables therein; and subclass 113 for underground conduits for supporting pipes therein. (See (6) Note, above.)
- 333, Wave Transmission Lines and Networks, subclasses 236+ for long transmission lines having distributed electrical parameters, and subclasses 1+ for plural channel systems of such lines.
- 343, Communications: Radio Wave Antennas, subclass 719 for antennas buried underground or submerged under water.

- 404, Road Structure, Process, or Apparatus, subclass 3, 4+, and 17+ for conduits combined with pavement, curb or gutter structure and not limited solely to electrical use. (See (6) Note, above.)
- 38** This subclass is indented under subclass 37. Structure arranged to deliver energy to plural points; also combined overhead and underground installations.
- (1) Note. Single manholes with plural conduits or cables radiating therefrom are in this class, subclass 37.
- (2) Note. See this class, subclass 43, for overhead distributing structures.
- (3) Note. Where an electrical system, i.e., more than the mere physical structure or arrangement to lead conductors to plural points, is claimed, see the appropriate electrical class, particularly Class 307, Electrical Transmission or Interconnection Systems, subclasses 11+ for plural load circuit systems, and 43+ for systems having plural supply circuits or sources.
- 39** This subclass is indented under subclass 37. Structure combined with the structure of a road or pavement, including sidewalks, gutters and curbs.
- (1) Note. For this combination complete the search in Class 404, Road Structure, Process, or Apparatus, subclasses 3, 4+ and 17+, for conduits combined with pavement, curb or gutter structure and not limited solely to electrical use.
- 40** This subclass is indented under the class definition. Structures specialized for positioning overhead.
- (1) Note. This subclass and indented subclasses for the most part are for means for supporting overhead conductors, cables and conduits.
- (2) Note. Insulator structures with means for securing the same to some support and/or to secure the conductor, etc., thereto are in this class, subclass 137 and indented subclasses.
- (3) Note. For overhead electrical means for transmission to vehicles, see Class 191, Electricity: Transmission to Vehicles.
- (4) Note. For overhead supports for cables and conduits not limited by insulation or other claimed characteristics to electrical apparatus, see Class 248, Supports, subclass 49 and indented subclasses.
- SEE OR SEARCH CLASS:
- 254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 134.3+ for process or apparatus for placing or stringing overhead wire, strand or cable.
- 333, Wave Transmission Lines and Networks, subclasses 236+ for long transmission lines having distributed electrical parameters, and subclasses 1+ for plural channel systems of such lines.
- 41** This subclass is indented under subclass 40. Structures in which the electrical equipment is suspended from an overhead or messenger cable.
- (1) Note. Complete the search in Class 248, Supports, subclass 61, for pipe or cable supports not restricted by insulation or other characteristics to electrical conductors.
- (2) Note. Insulator structures having means specially designed to engage a wire for supporting the insulator are in this class, subclass 137 and indented subclasses; see particularly subclass 146, for wire mid-line spacers, and subclass 160, for other wire engaging insulator suspending means.
- (3) Note. See Class 24, Buckles, Buttons, Clasps, etc., subclasses 115+, for cord and rope holders, per se.
- (4) Note. See Class 191, Electricity: Transmission to Vehicles, particularly subclasses 40+.

SEE OR SEARCH CLASS:

- 254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 388+ for means supported by, and maintaining relative spacing between, longitudinal runs or an endless, load carrying or moving cable.
- 42** This subclass is indented under subclass 40. Structures having means to damp out mechanical vibrations in the supported conductor, cable or conduit.
- (1) Note. Dampers, per se, not claimed in combination with supporting structure are here.
- (2) Note. Compare this class, subclasses 146 and 147, for insulators for spacing wires between supports and having a mechanical vibration damping function.
- (3) Note. See Class 248, Supports, subclasses 63 and 560+ for resilient supports having such means and not restricted by insulation or other characteristics to electrical conductors, cables or conduits.
- (4) Note. See Class 267, Spring Devices, subclass 178, for a spring device of the coil spring type useful in vibration dampening support structure for overhead conductors.
- 43** This subclass is indented under subclass 40. Structures arranged (1) to deliver electrical energy to a plurality of points or (2) to be supported at a plurality of spaced points.
- (1) Note. For other distributing arrangements, see this class, subclasses 38, 49, 71, and 72.
- (2) Note. See this class, subclass 41, for the messenger cable type of plural point support.
- (3) Note. See this class, subclass 148 and indented subclasses, for plural insulator assemblies to support plural conductors at one place or to support single conductors at one place.
- (4) Note. For electrical systems of transmission and distribution, i.e., more than the mere physical structure to support at, or lead conductors to, a plurality of points, see the appropriate class, particularly Class 307, Electrical Transmission or Interconnection Systems, subclasses 11+ for plural load circuit systems, and subclasses 43+ for systems having plural supply circuits or sources.
- 44** This subclass is indented under subclass 40. Structures having (1) conductor connectors or terminal panels, or (2) means to lead or “fan” the conductors of a plural conductor cable to separated points on the overhead support.
- (1) Note. See this class, subclasses 59, 60, 175, and 176 and indented subclasses, for cable and conduit junction boxes and terminal structures which include means for separating the conductors of a plural conductor cable or conduit in a box or at the end of the cable or conduit.
- 45** This subclass is indented under subclass 40. Structures claiming single towers, poles or posts. The combination of tower, pole or post with its cross-arms is here.
- (1) Note. See this class, subclass 43, for patents claiming two or more towers, poles or posts in combination. A single tower may be comprised of a plurality of poles or posts.
- (2) Note. For insulators and their securing means, per se, see this class, subclass 137 and indented subclasses.
- (3) Note. See Class 52, Static Structures (e.g., Buildings), subclasses 40, 146+, 153+, 155+, 292+, 651.01+, and 720.1+ for a mast, pole or post not restricted to electrical use.
- (4) Note. See Class 191, Electricity: Transmission to Vehicles, particularly subclasses 32, and 33 and indented subclasses, for similar structures specially designed for transmission to moving vehicles or objects, i.e., to support a

conductor for contact by a relatively movable collector.

- (5) Note. See Class 362, Illumination, subclass 431, for lamp-post.
- (6) Note. See Class 343, Communications: Radio Wave Antennas, subclasses 874+ for mast or tower type antennas; subclass 886 for antennas horizontally suspended between poles or standards; and subclasses 890+ for antennas on a post, standard or tower.
- 46** This subclass is indented under the class definition. Structures in the form of handles.
- (1) Note. Complete the search in Class 200, Electricity: Circuit Makers and Breakers, subclasses 61.85+ for switches actuated concurrently with the use of a manipulating, operating or carrying handle; and subclass 332.2, for handles having mechanical switches.
- (2) Note. For conductor take-up reels in handles limited to use with electrical conductors, see Class 191, Electricity: Transmission to Vehicles, subclass 12 and indented subclasses.
- (3) Note. See Class 242, Winding, Tensioning, or Guiding, for combined handle and reel structures, particularly subclass 588.2 for carriers on handles.
- (4) Note. See Class 248, Supports, subclasses 51 and 52, for tool cord supports.
- (5) Note. For mere insulated handles, see Class 16, Miscellaneous Hardware, subclasses 431+ and indented subclasses.
- (6) Note. For electric space discharge devices (e.g., spark ignitors) which are provided with handles, see Class 313, subclass 48, for such space discharge devices, per se, with handles and Class 315, subclass 33 for such handles in combination with the source of supply, the space discharge device and the circuit elements so as to make a portable-self-contained device.

- (7) Note. For inductors with handles, see Class 336, Inductor Devices, subclass 66.

47 Structures for conveying fluids and also for conducting electrical energy.

- (1) Note. See this class, subclass 8 and indented subclasses, for structures in which fluids are employed for or applied to the electrical apparatus.
- (2) Note. See Class 405, Hydraulic and Earth Engineering, subclasses 132+ and Class 404, Road Structure, Process, or Apparatus, subclasses 3, 4+ and 17+, for conduits combined with pavement, curb or gutter structure and not limited solely to electrical use.
- (3) Note. See Class 138, Pipes and Tubular Conduits, subclasses 129+, 137+ and 140+ for composite pipes having metal, frequently in the form of wire strands. Where the structure incorporates the wire in insulated relation for electrical conductive purposes, it is in this class (174).
- (4) Note. See Class 340, Communications: Electrical, subclass 320 for electric systems for signaling along a fire hose or other fluid conduit.
- (5) Note. Search Class 313, Electric Lamp and Discharge Devices, subclasses 11+, for electric lamps and space discharge devices which are provided with means for conducting a temperature modifying fluid to the lamp or discharge device, the fluid conducting means being designed for use also as an electrical conductor, and Class 315, Electric Lamp and Discharge Devices: Systems, subclass 50, for electric lamps and discharge devices which have means for conducting a temperature modifying medium to the lamp or discharge device, the fluid conducting means being designed for use as an electrical impedance.

- 48** This subclass is indented under the class definition. Conduits and/or housings mounted on, in or through the walls of building structures.
- (1) Note. For lightning protective means combined with building structures, see this class, subclasses 2 and 3.
 - (2) Note. For box or housing supporting means not limited to wall mounting, see this class, subclass 50 and indented subclasses, particularly subclasses 58 and 63.
 - (3) Note. For bushing type insulators mounted in a wall or plate, see this class, subclass 151, and indented subclasses.
 - (4) Note. Conduits and conduit systems specially installed in a wall, floor or ceiling of a building, where characteristics not limited solely to electrical use are claimed, such as the presence of conductors, use of insulators in addition to the conduit structure, etc., will be found in Class 52, Static Structures (e.g., Buildings), subclasses 220.1+.
 - (5) Note. Wall mounted receptacles, including outlet and junction box type, are in Class 220, Receptacles, subclasses 3.3 and indented subclasses and 476+.
- SEE OR SEARCH CLASS:
- 73, Measuring and Testing, subclass 201.
 - 108, Horizontally Supported Planar Surfaces, subclasses 42+ for horizontally supported planar surface combined with the structure of a building, and subclass 152 for a laterally mounted shelf.
 - 137, Fluid Handling, subclasses 357+ for fluid handling devices including a building or part thereof as a support.
 - 193, Conveyors, Chutes, Skids, Guides, and Ways, subclass 33.
 - 211, Supports: Racks, subclasses 87.01+.
 - 224, Package and Article Carriers, subclass 29.5 and 400+.
 - 248, Supports, subclasses 27.1+ and 317+.
 - 312, Supports: Cabinet Structure, subclass 242 and 245+, for wall mounted housings of general utility.
- 333,** Wave Transmission Lines and Networks, subclasses 236+ for long transmission lines having distributed electrical parameters, and subclasses 1+ for plural channel systems of such lines.
- 49** This subclass is indented under subclass 48. Structures having two or more spaced outlets and/or having two or more conduits.
- 50** This subclass is indented under the class definition. Boxes and housings limited by claimed structure to electrical use, but having no claimed characteristics limiting the same to particular characters of electrical equipment classifiable in other main classes.
- (1) Note. The mere naming of the electrical device housed will not exclude the same from this class, but where characteristics of the device housed are claimed, classification is with such device.
 - (1.5) Note. This and the indented subclasses include envelopes, casings, and housings such as are used for electric lamps, electric space discharge devices and similar electrical devices which are enclosed in vitreous, ceramic, nonmetallic plastic or metallic envelopes or casings. See section 7 of the class definition. See especially indented subclasses 50.5+ where the envelope, box or housing is hermetically sealed. In many of these devices the casing, housing or envelope is provided with lead-in wires or conductors for conducting electric current through the wall of the envelope, casing or housing.
 - (2) Note. See this class, subclass 8 and indented subclasses, for boxes and housings limited to use with fluids or vacuum, particularly subclasses 17 and 18.
 - (3) Note. See this class, subclass 37 and indented subclasses, for underground housings, and subclass 40 and indented subclasses, for overhead housings.
 - (4) Note. See this class, subclass 46, for housings in the form of handles.

- (5) Note. See this class, subclasses 48 and 49, for wall mounted housings.
- (6) Note. See this class, subclasses 74 and 84 and their indented subclasses, for conduit, cable and conductor end structures and joints.
- SEE OR SEARCH CLASS:**
- 52, Static Structures (e.g., Buildings), subclasses 220.1+ for building constructions with service duct not limited to electrical features.
- 109, Safes, Bank Protection, or a Related Device.
- 150, Purses, Wallets, and Protective Covers.
- 190, Trunks and Hand-Carried Luggage.
- 200, Electricity: Circuit Makers and Breakers, subclass 168.
- 206, Special Receptacle or Package.
- 215, Bottles and Jars.
- 217, Wooden Receptacles.
- 220, Receptacles, subclasses 2.1+ for envelopes or housings for electric lamps or similar devices where no electrical structure is claimed, subclasses 3.2+ for receptacles having provision for extending strands, rods, pipes, etc., through the receptacle wall or for coupling them to the receptacle wall.
- 248, Supports, subclass 317 and 342+.
- 312, Supports: Cabinet Structure.
- 313, Electric Lamp and Discharge Devices, appropriate subclasses, for electric lamps and discharge devices which are provided with an envelope, box or casing where significant structure is claimed which limits the subject matter to use as an electrical lamp or electric space discharge device. See Section 7 of the class definition for the envelopes for lamps and discharge devices included in this class.
- 324, Electricity: Measuring and Testing, subclass 156 for electric meter casings.
- 334, Tuners, subclass 85 for an electrical tuner provided with housing means.
- 335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclass 278 for magnets and electromagnets with housings.
- 336, Inductor Devices, subclasses 90+ for transformers and inductive reactors in combination with a casing or housing.
- 337, Electricity: Electrothermally or Thermally Actuated Switches, subclass 20, 34, 112, 121, 186+, 327+, 380+, 398, and 414+ for specific types of electrothermal and thermal operated switches with housing.
- 338, Electrical Resistors, subclasses 226+ for an incased, embedded, or housed fixed electrical resistor. For the lines between Class 174 and Class 338, see the class definition of Class 338.
- 361, Electricity: Electrical Systems and Devices, subclasses 331+ for boxes, mounting and housing means with plural diverse electrical components. Even though a box or housing is claimed by name only in conjunction with said plural diverse electrical components, the patent is excluded from Class 174 and located only in Class 361.
- 362, Illumination, subclasses 362+.
- 429, Chemistry: Electrical Current Producing Apparatus, Product, and Process, subclass 158, 161, and 163 for battery receptacles having conductor structure.
- 50.5** This subclass is indented under subclass 50. Envelopes which are hermetically sealed.
- (1) Note. The term envelope is defined to include boxes, housings or other hermetically sealed receptacles in this and the indented subclasses.
- (2) Note. Many of the envelopes in this and the indented subclasses are of the type used for electric lamps, electric space discharge devices and similar electrical devices. See Lines With Other Classes, 1.,
- (3) Note. Most of the envelopes in this and the indented subclasses are provided with lead-in conductors for conducting

electrical energy to the device within the envelope.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 9, and 17.05+, and the subclasses specified in the Notes thereto for this subject matter where a fluid is used or where the structure is provided with means peculiarly adapted for use with a fluid (e.g., an evacuating stem or opening or a fluid seal), and see subclass 9 where the structure includes a current conductive fluid or where a vacuum is used.
- 35, for this subject matter where the structure includes an electrostatic or electromagnetic shielding means, and for envelopes with a shield which wholly or partially surrounds the envelope.
- 65, for other boxes and housings under subclass 50 which are provided with means to couple a cable, wire or conduit to the box or housing.
- 151+, for devices (e.g., bushings) for insulating a conductor from a wall or plate through which the conductor extends (the bushing may be fluid tight).

SEE OR SEARCH CLASS:

- 200, Electricity: Circuit Makers and Breakers, appropriate subclasses for vacuum switches and subclass 32, 81.6 and 152 for liquid contact (mercury switches).
- 220, Receptacles, subclasses 2.1+ for envelopes (including those which are hermetically sealed) for electric lamps, electric space discharge devices, and similar devices.
- 313, Electric Lamp and Discharge Devices, subclasses 317+ and the subclasses specified in the Notes thereto for electric lamp and electric space discharge devices which are provided with a hermetically sealed envelope. See Lines With Other Classes, 1., of the class definition of this class (174) with respect to the distinction between Classes 174 and 313.

- 337, Electricity: Electrothermally or Thermally Actuated Switches, subclasses 28+ for electrothermal switches with hermetically sealed housing, casing or envelope.
- 373, Industrial Electric Heating Furnaces, subclass 54, 63, 110+, and 140+ for electric furnaces having a sealed gas filled or evacuated chamber.
- 403, Joints and Connections subclass 179 and 265+ for miscellaneous joints between diverse materials bonded together.

50.51 This subclass is indented under subclass 50.5. Subject matter having a casing or jacket surrounding the envelope or a portion thereof, or having the envelope wholly or partially covered with a coating or similar covering material.

- (1) Note. This subclass includes envelopes within the definition of subclass 50.5 which have an integral double wall.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 35, where the casing, jacket or covering is an electromagnetic or electrostatic shield.

SEE OR SEARCH CLASS:

- 220, Receptacles, subclasses 2.1+ for the structure of double walled and coated envelopes for electric lamps and electric space discharge devices where no electrical structure is claimed.
- 313, Electric Lamp and Discharge Devices, subclass 312 and the subclasses specified in the Notes thereto for electric lamps and discharge devices which are provided with a hermetically sealed envelope and a separable casing or jacket surrounding the envelope, and subclasses 317+ and the subclasses specified in the Notes thereto for electric lamp and discharge devices having integral double wall hermetically sealed envelopes or a covered or coated hermetically sealed envelope.
- 428, Stock Material or Miscellaneous Articles, appropriate subclasses, for a single or plural layer stock material and

for miscellaneous articles, see especially subclass 34 for a plurality of light transmissive sheets or webs spaced from each other and hermetically sealed at their edges and enclosing a gas space therebetween and subclasses 34.1+ for a container type miscellaneous article.

50.52 This subclass is indented under subclass 50.5. Subject matter in which the envelope has combined therewith an electrical connector for connecting a lead-in conductor of the envelope to an external conductor, or where the envelope has a portion thereof formed so as to be at least a part of an electrical connector.

- (1) Note. This and the indented subclass includes hermetically sealed envelopes such as are used for electric lamps, electric space discharge devices, and similar devices which are provided with a screw type or plug type base as well as envelopes where the lead-in conductors are either shaped so as to form electrical connectors or are of sufficient rigidity to form contacts (usually plug type contacts) subject to the limitations of (2) Note. The indented subclass includes devices where a portion of the enclosing wall of the envelope is shaped so as to form an electrical connector.
- (2) Note. This subclass provides for the structure of the envelope with connector structure where significant structure of envelope is recited in addition to that necessary to support or mount the electrical connector. See section 17.5 of the class definition of this class (174). See Class 439, Electrical Connectors, for electrical connector structure, and see especially subclasses 611+ for the combination of a vitreous envelope and an electrical connector in which no significant structure of the envelope is recited other than that necessary to support or mount the electrical connector.

SEE OR SEARCH THIS CLASS, SUBCLASS:

17.08, for this subject matter where a fluid is used or where structure is provided

peculiarly adapted for use with a fluid (e.g., an evacuating stem or opening).

SEE OR SEARCH CLASS:

313, Electric Lamp and Discharge Devices, subclasses 318.01+ and the subclasses specified in the Notes thereto for electric lamps and electric space discharge devices which have a hermetically sealed envelope with an electrical connector (e.g., a base) thereon or formed as a part thereof.

50.53 This subclass is indented under subclass 50.52. Subject matter where the envelope has a portion thereof formed so as to be at least a part of an electrical connector.

- (1) Note. The portion of the envelope which forms the part of the electrical connector may be a metallic wall portion which is used to complete the wall portion of a glass or ceramic envelope.
- (2) Note. Devices where the lead-in wires only are formed or are of sufficient rigidity to form contacts are in subclass 50.52 and not in this subclass. This subclass includes devices having a wall portion sealed with a metallic closure which is designed for use as an electrical connector.
- (3) Note. Included in this subclass are envelopes of metals, glass or other ceramic which have a portion formed with screw threads so as to form a part of a screw threaded base type connector. The threads may or may not be covered with conductive material.

50.54 This subclass is indented under subclass 50.5. Subject matter having means to mount an electrical device within the envelope.

- (1) Note. This subclass provides only for hermetically sealed envelopes where the mounting means within the envelope is of general utility, that is, where the mounting structure claimed could be used for mounting any one of a number of different devices such as electrical condensers, inductances, resistors, switches, etc. The mere recitation of an

electrode or electrode assembly broadly recited as the thing mounted will not exclude the device from this subclass, but if the electrode is claimed as a filament, anode, grid, cathode, or other specific electrode in the case of a lamp or electric space discharge device the device will be excluded and will be found in Class 313, Electric Lamp and Discharge Devices, subclasses 238+.

Where the supporting structure is not of general utility, but is of the type useful only in mounting the electrodes of a lamp or electric space discharge device, the patent is excluded from this class (174) and will be found in Class 313 even though the electrodes are not claimed specifically.

SEE OR SEARCH THIS CLASS, SUBCLASS:

52.1, for other boxes and housings under subclass 50 with means for mounting an electrical device within the box or housing.

SEE OR SEARCH CLASS:

313, Electric Lamp and Discharge Devices, subclasses 228+. See (1) Note above with reference to Class 313.

50.55 This subclass is indented under subclass 50.5. Subject matter having a hollow tubular lead-in conductor passing through the wall of the envelope and having another lead-in conductor arranged within the hollow lead-in conductor.

- (1) Note. The lead-in conductors are ordinarily concentrically arranged. This subclass includes therefor envelopes with co-axial lead-ins where no electrical characteristics of the lead-ins such as the inductance, capacity, or resonant features are involved and also includes envelopes where the portion of the lead-ins which passes through the wall are stepped or displaced along the length of each other as in some types of "light house" tubes.

SEE OR SEARCH THIS CLASS, SUBCLASS:

50.53, for this subject matter where the hollow tubular lead-in is a part of the

envelope wall and is designed also for use as an electrical connector and the other lead is arranged within the hollow lead-in (as in some types of "light house" tubes).

151+, for devices (e.g., bushings) for insulating a plurality of concentric arranged conductors from a wall or plate through which the conductors extend (the bushing may be fluid tight).

SEE OR SEARCH CLASS:

178, Telegraphy, subclass 44, for concentrically arranged transmission lines including those with hermetically sealed joints between the conductors and those designed to pass through a wall or plate where electrical characteristics of the conductors, such as the inductance, capacity or resonant features are involved.

315, Electric Lamp and Discharge Devices: Systems, subclass 39 for electric lamps and electric space discharge devices which have structurally combined therewith a wave guide or co-axial high frequency transmission line (the wave guide or coaxial line may extend through the walls of the envelope of the device).

50.56 This subclass is indented under subclass 50.5. Subject matter wherein the envelope has at least a portion of its wall formed of metal or other conductive material with a lead-in conductor which passes through the metal or conductive wall position and is insulated therefrom.

- (1) Note. This subclass includes patents where the envelope is formed substantially entirely of metal and has lead-in conductors passing through the wall.
- (2) Note. Where only the structure of the lead-in conductors, the wall of the envelope, and the means for insulating it from the wall is claimed, the device is classified in subclasses 151+ of this class as a bushing. Such structure is classified in subclasses 151+ even if the envelope is claimed where no characteristics of the envelope are claimed in addition to the

bushing structure. Envelopes having a plurality of separate lead-in conductors passing through the metal wall are classified in this subclass (50.56).

SEE OR SEARCH THIS CLASS, SUBCLASS:

50.55, where the envelope has two concentrically arranged conductors passing through the wall of the envelope, one of which may form a part of the envelope wall.

50.57 This subclass is indented under subclass 50.5. Subject matter having one or more lead-in conductors sealed into a disk, stem structure or other supporting structure, the disk, stem or supporting structure forming a closure for the envelope.

- (1) Note. The structures in this and the indented subclass are characterized primarily in that there is a joint between the closure which supports one or more lead-in conductors and the envelope as distinguished from the type of device which has the envelope sealed directly about the lead-in conductors. The disk, stem or supporting structure for the lead-in conductor may be of the same or different material as that of the envelope.

SEE OR SEARCH THIS CLASS, SUBCLASS:

50.56, where the disc or closure is formed of metal or other conductive material.

SEE OR SEARCH CLASS:

220, Receptacles, subclasses 24+ for the structure of miscellaneous closures for receptacles.

50.58 This subclass is indented under subclass 50.57. Subject matter where the disk, stem structure or supporting structure for the lead-in is joined to the envelope by a fused seal.

- (1) Note. The seal may be a glass to glass joint, a metal to metal joint or a glass to metal joint. Where cement is used to join the disk or stem structure to the envelope, see subclass 50.57.

SEE OR SEARCH THIS CLASS, SUBCLASS:

50.61+, for bonded seals between a lead-in conductor and the envelope wall.

50.59 This subclass is indented under subclass 50.5. Subject matter provided with means for shielding the joint between the lead-in conductor and the portion of the envelope through which the lead-in passes, or for preventing electrical leakage currents between the lead-in conductors along the envelope wall.

- (1) Note. The shield may be for the purpose of preventing a deposit of sputtered or vaporized material upon or around the lead-in and the envelope portion adjacent thereto, or to prevent the sealing material at the joint from being attacked by deleterious substances, or for any other shielding purpose.

SEE OR SEARCH THIS CLASS, SUBCLASS:

17.08, and 55.52+, where the device is provided with an electrical connector (e.g., a base) and the electrical connector is formed so as to constitute a shield between the lead-in conductors or for the joint.

35, for hermetically sealed envelopes within the class definition with electrostatic or electromagnetic shields for the envelope or a part thereof.

SEE OR SEARCH CLASS:

313, Electric Lamp and Discharge Devices, subclass 626 for gas or vapor type electric lamps and electric space discharge devices with shielding means for the lead-in conductors, subclass 313 for the miscellaneous electric lamps and discharge device with electrical shielding means for the device or a part thereof, and subclasses 317+ for electric lamps and discharge devices with lead-in conductors including such devices as have shielding means for the lead-in joint or between the lead-in conductors.

50.6 This subclass is indented under subclass 50.5. Subject matter having structure especially provided for a plurality of lead-in conductors.

- (1) Note. Included in this subclass are only devices where there is significance to the use of a plurality of lead-ins. If the lead-ins merely duplicate each other, then no cross-reference of the patent is placed in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 50.52+, where the envelope is provided with an electrical connector.
 50.55, where one of the lead-ins is a hollow conductor which surrounds another lead-in (e.g., co-axial).
 50.57+, where a plurality of lead-in conductors pass through a closure disk or stem structure which is sealed into an opening in the envelope wall.
 50.59, where there is shielding means to prevent leakage currents between two lead-in conductors.

SEE OR SEARCH CLASS:

- 313, Electric Lamp and Discharge Devices, subclasses 317+ for electric lamps and discharge devices with a plurality of lead-in conductors.

50.61 This subclass is indented under subclass 50.5. Subject matter wherein a lead conductor which passes through the wall of the envelope is sealed to the envelope by means of a bonded seal.

- (1) Note. A bonded joint is a joint in which the joining is performed by casting, welding, soldering, brazing or other method requiring the use of molten or semi-molten material, cement, or other adhesive, or where at least one of the parts to be joined is made of plastic and the joint is made by pressing the parts together so that they adhere to each other. The usual glass-to-metal seal is an example of a bonded joint.
- (2) Note. This and the indented subclasses are residual places for patents for envelopes with bonded lead-ins which

involve more than mere joint structure such as would be classified in one of the classes providing for joints and which do not involve sufficient other structure to be classified in the above subclasses of this class or in another class.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 151+, for devices (e.g., bushings for insulating a conductor from a wall or plate through which the conductor extends). Some of these bushings include a bonded joint between the lead-in conductor and the insulator or between the insulator and the wall or plate. Where only the structure of the lead-in conductor, the wall of the envelope and the means for insulating it from the wall is claimed, the device is classified in subclasses 151+ as a bushing, even though the envelope is claimed where no characteristics of the envelope are claimed in addition to the bushing structure.

SEE OR SEARCH CLASS:

- 65, Glass Manufacturing, subclasses 36+ for a process of fusion bonding glass to a preformed part by a glassworking operation.
 313, Electric Lamp and Discharge Devices, subclasses 317+ for electric lamps and electric space discharge devices having lead-in wires passing through the envelope walls and sealed to the wall by a bonded seal.
 403, Joints and Connections, subclasses 265+ for molded joints in general.
 428, Stock Material or Miscellaneous Articles, subclass 630 for stock comprising plural adjacent metallic components and an additional silica or other oxide component.

50.62 This subclass is indented under subclass 50.61. Subject matter where the lead-in conductor is sealed to the envelope by means of a plastic material or by the use of a cement.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

17.06, where the material used to form the seal is a liquid or where the seal includes a liquid (e.g., as mercury).

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, appropriate subclasses for the composition of cements and plastic materials.

50.63 This subclass is indented under subclass 50.61. Subject matter where the lead-in conductor is in the form of a disc or ring, or has a flange forming a disc or ring thereon or is a metal tube, with the envelope sealed to either the side or edge of the disc or ring, or to the metal tube.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

50.55, where there are two lead-in conductors, one of which is a tube surrounding the other, and the envelope is sealed to the outer conductor and another hermetic seal is formed between the inner conductor and the outer conductor.

50.58, where a metal disc forms the closure for a ceramic or glass envelope and the closure and envelope are sealed together by a fused type seal.

50.64 This subclass is indented under subclass 50.61. Subject matter where the lead-in conductor is a foil or is in the form of a flat strip.

51 This subclass is indented under subclass 50. Structures provided with means to connect a ground wire to the box or housing.

(1) Note. See this class, subclass 78.

52.1 With electric device or mounting means therefor:

This subclass is indented under subclass 50. Structures having an electric device therein, or thereon, or having means to mount such a device.

52.2 Potted or encapsulated:

This subclass is indented under subclass 52.1. Subject matter wherein the space between the box or housing and the electrical device contained therein is occupied by a solid or semi-solid mass of insulating material; or wherein the electrical device is directly encapsulated in a mass of insulating material with such mass itself forming the housing.

SEE OR SEARCH CLASS:

29, Metal Working, subclass 841 and 855+ for conductor or circuit manufacturing involving encapsulating or potting of electrical components.

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclasses 272.11+ for processes of encapsulating electrical components.

336, Inductor Devices, subclass 96 for potted inductor devices wherein some significant detail of the inductor device is claimed.

338, Electrical Resistors, subclass 269 and 275 for resistors with molded casings or housings.

361, Electricity: Electrical Systems and Devices, subclasses 331+ for plural components which are potted or encapsulated.

52.3 Sealed:

This subclass is indented under subclass 52.1. Subject matter wherein the box or housing is hermetically sealed.

52.4 Flat housing for electronic device (e.g., flat pack, dual-in-line package):

This subclass is indented under subclass 52.3. Subject matter wherein the box or housing has a generally flat shape and houses or is particularly adapted to house an electronic device, such as an integrated circuit or a transistor.

(1) Note. Included in this subclass are electronic packages known in the trade as "Flat-Packs" and "Dual-In-Line" packages.

(2) Note. This subclass provides for electronic packages in combination with lead frames, but does not take lead frames, per se. For the structure of lead frames,

per se, see Class 257, subclasses 666 and 677. However, if stock material is claimed either as an individual lead frame without being labeled “lead frame”, or if the lead frame structure is a strip of interconnected lead frames prior to separation into individual lead frames, see Class 428, subclasses 571-4.

SEE OR SEARCH CLASS:

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses for active solid-state semiconductor devices, per se, especially subclasses 678+ for active solid-state device housings, in general.

52.5 Header, mounting stud, or can-type housing for semiconductor or crystal:

This subclass is indented under subclass 52.3. Structures in the form of a can (e.g., TO-5 type) or which include an insulating support (header or mounting stud) for the leads entering the housing.

SEE OR SEARCH CLASS:

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses for active solid-state semiconductor devices, per se, especially subclasses 678+ for active solid-state device housings, in general, including subclasses 731-3 for housing mounts.

52.6 Pellet type housing:

This subclass is indented under subclass 52.3. Subject matter wherein the box or housing is disc-shaped with the flat surfaces forming electrical contacts for the electrical device therein.

53 This subclass is indented under subclass 52.1. Structures in which the means are specially designed for mounting plug receptacles or wall switches.

(1) Note. When the characteristics of the switch are claimed, classification is in Class 200, Electricity: Circuit Makers and Breakers.

(2) Note. Search Class 439, Electrical Connectors, subclasses 527+ for an electrical

connector combined with supporting means therefor; especially subclass 535 for an electrical receptacle with an “outlet box”. For the line with respect to housings, boxes or receptacles between this class (174) and Class 439, see (15) Note and see (17) Note of the class definition of this class.

54 This subclass is indented under subclass 53. Structures having in addition means to couple or mount an electrical fixture.

(1) Note. See this class, subclass 61 and indented subclasses.

55 This subclass is indented under subclass 53. Structures in which the mounting means is unitary with the face plate.

(1) Note. See this class, subclasses 66 and 67, and the notes thereunder, for face plates.

56 This subclass is indented under subclass 55. Structures in which the mounting means is on the portion of the face plate on the outside of the box or housing.

57 This subclass is indented under subclass 53. Structures in which two or more parts of the box, or the mounting means, are relatively adjustable.

(1) Note. Complete the search in class 220, Receptacles, subclass 3.7.

58 This subclass is indented under subclass 53. Structures having in addition means to mount the box or housing.

(1) Note. Complete the search in this class, subclass 63, and in class 220, Receptacles, subclasses 3.9 and 3.92, and see the notes thereunder for box and housing mounting means.

(2) Note. Compare this class, subclass 48 and indented subclasses.

59 This subclass is indented under subclass 52.1. Structures in which the box or housing has a plurality of connectors for fanning out a plurality of incoming and/or outgoing conductors.

- (1) Note. See Class 361, Electricity: Electrical Systems and Devices, subclasses 335+ for arrangements of circuit closers on a mounting or the combination with the conductors or bus-bars, including encased switchboards.
- (2) Note. Search Class 439, Electrical Connectors, subclasses 527+ for an electrical connector combined with supporting means therefor; especially subclass 535 for an electrical receptacle with an “outlet box”.
- 60** This subclass is indented under subclass 59. Structures which form the terminal end of conduits or cables.
- (1) Note. See this class, subclasses 73.1 and 74 and indented subclasses, for terminals not of the box or housing type.
- 61** This subclass is indented under subclass 52.1. Structures having means for coupling or mounting an electrical fixture (which is to be external of the box or housing) to the housing.
- (1) Note. Complete the search in this class, subclass 54.
- (3) Note. See Class 248, Supports, subclasses 317+.
- 62** This subclass is indented under subclass 61. Structures in which the coupling or mounting means is in the form of a stud or nipple.
- 63** This subclass is indented under subclass 62. Structures in which there is in addition means to mount the box or housing.
- (1) Note. Complete the search in this class, subclass 58, and in Class 220, Receptacles, subclasses 3.9 and 3.92, and see the notes thereunder.
- (2) Note. Compare this class, subclass 48 and indented subclasses.
- 64** This subclass is indented under subclass 62. Structures having in addition conduit or cable coupling means.
- (1) Note. See this class, subclass 65 and the notes thereunder.
- 65** This subclass is indented under subclass 50. Structures having means to couple a cable, wire or conduit to the box or housing. Such means may be the conduit or cable openings in the box, with or without a closure therefor. The subcombination of conduit or cable with connector is here.
- (1) Note. This subclass includes casings and jackets that are of general utility and are otherwise within the subclass definition such as may be used for electric lamps, space discharge devices, and similar devices.
- (2) Note. See Lines With Other Classes, 1., of the Class Definition for the electrical devices that include such envelopes and casings.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 18, for boxes and housings with a bushing, terminal, or lead-in using a fluid or provided with structure peculiarly adapted for use with a fluid.
- 50.5+, for a sealed envelope and housing such as are used for an electric lamp, electric space discharge device, and similar device, especially subclasses specified in search notes thereto.
- 64, for a combination of a conduit, cable, or conductor and means to couple the same to a box.
- SEE OR SEARCH CLASS:
- 200, Electricity: Circuit Makers and Breakers, subclasses 293+ for a switch case or mounting base having specific housing or supporting structure.
- 220, Receptacles, subclasses 3.2+ for means having no claimed electrical characteristics to couple a box or housing of a junction or outlet to a pipe or rod.
- 277, Seal for a Joint or Junction, for a generic sealing means or process, subclass 606 for a static seal for a pipe, conduit or cable, and a wall,

- subclass 919 for a seal including an electrical feature.
- 285, Pipe Joints or Couplings, subclasses 136.1+, 154.1+ and 189+ for means having no claimed electrical characteristics coupling a pipe to a box or plate.
- 313, Electric Lamp and Discharge Devices, appropriate subclasses for electric lamps and electric space discharge devices provided with a casing, especially subclass 324 and notes thereto.
- 361, Electricity: Electrical Systems and Devices, subclasses 212+ for discharge or preventing accumulation of electric charge (e.g., static electricity, etc.).
- 373, Industrial Electric Heating Furnaces, appropriate subclasses where the device is an electric furnace.
- 403, Joints and Connections, for joints of general applications.
- 439, Electrical Connectors, subclasses 445+ for an electrical connector having a flexible or pivoted guard or support for a line cord or conductor.
- 66** This subclass is indented under the class definition. Structures which constitute a closure for a box, housing or wall opening and which are provided with openings for communicating with devices concealed by the closure. Such openings may have means for coupling a device in the opening.
- (1) Note. See this class, subclasses 55, 56 and 57.
- (2) Note. Face plates having means specially designed for guiding the prongs of electric plug elements have been placed in this subclass or subclass 67 indented hereunder.
- (3) Note. See Class 220, Receptacles, subclasses 241+ for face plates having no added structure limiting the same to electrical use, even though claimed as made of conductive and/or insulating material, and see the search notes thereunder for related art.
- 67** This subclass is indented under subclass 66. Structures having additional closures for the face opening or openings.
- (1) Note. Complete the search in Class 220, Receptacles, subclass 242.
- 68.1 CONDUITS, CABLES OR CONDUCTORS:**
This subclass is indented under the class definition. Structures of conduits, cables or conductors .
- (1) Note. See this class, main class definitions, especially 2, 3, 6, 8, and 9 as well as main class notes (1) through (14) for criteria which distinguish the structures found in this class from those of other classes.
- SEE OR SEARCH THIS CLASS, SUBCLASS:**
- 8+, particularly subclasses 24+ for such structures utilizing fluids.
- 32+, for anti-inductive structures.
- 37+, for underground installations.
- 40+, for overhead installations.
- 48, and 49, for wall mounted installations.
- SEE OR SEARCH CLASS:**
- 254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 134.3+ for methods or apparatus used in installing such structures.
- 294, Handling: Hand and Hoist-Line Implements, especially subclass 19 for devices used in placing such structures.
- 333, Wave Transmission Lines and Networks, subclasses 236+ for long transmission lines having distributed electrical parameters, and subclasses 1+ for plural channel systems of such lines.
- 338, Electrical Resistors, appropriate subclasses for electrical resistors, per se. See the class definition under Class 338 for certain classification lines relating to this subject matter.
- 343, Communications: Radio Wave Antennas, subclass 700 for antennas which may include a conduit, cable or conductor. See also (4) Note. B,

- under subclass 700 and (1) Note under subclass 900 of this class (343) for classification lines between conduits, cables or conductors and antennas.
- 405, Hydraulic and Earth Engineering, subclass 154.1 for a method or apparatus for the subterranean or submarine laying, retrieving, manipulating, or treating of a conductor; and subclass 184.4 for the advancing or removing of a conductor through a pipe in a subterranean or submarine location.

68.2 Bus bars or bus ducts (residual):

This subclass is indented under subclass 68.1. Subject matter pertaining to bus bars or bus ducts.

- (1) Note. This is the residual subclass for subject matter directed to bus bars and bus ducts which is not provided for in any of the other bus bar subclasses of this class namely, subclasses 16.2, 70, 71, 72, 88, 99, 129, 133, and 149. Since, with the exception of subclass 16.2, the other bus bar subclasses in Class 174 do not have individually tailored definitions, determination of the subject matter falling within this subclass (68.2) can only be made after comparison with these other bus bar subclasses.
- (2) Note. Examples of the subject matter found in this subclass are: bus bars supported on an insulator without an enclosing bus duct, bus ducts, per se, and certain bus bar and bus duct assemblies.

SEE OR SEARCH CLASS:

- 191, Electricity: Transmission to Vehicles, appropriate subclasses for bus bars and bus ducts adapted for sliding or rolling current collection to supply electricity to vehicles.
- 307, Electrical Transmission or Interconnection Systems, subclass 147 for bus bar systems.
- 361, Electricity: Electrical Systems and Devices, subclass 341, 355, 361, and 378 for bus bars and bus ducts in combinations with subject matter of that class.

- 439, Electrical Connectors, subclass 22 for bus bars and bus ducts including detachable electrical connector structure or including provisions for receiving a detachable electrical connector.

68.3 Single duct conduits:

This subclass is indented under subclass 68.1. Structures pertaining to conduits of the single duct type.

- (1) Note. For the line between the subject matter in this subclass and the structures in Class 138, Pipes and Tubular Conduits, see (8) Note to the main definitions of this class (174).
- (2) Note. This subclass does not provide for single duct conduits having a removable wall. For such subject matter see subclass 101 of this class (174).
- (3) Note. See this class, class definition (9) to (13) Notes for a list of classes having conduits combined with the subject matter thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 24, for conduits in combination with a fluid or having means particularly adapted for use in connection with a fluid.
- 47, for a combined fluid conduit and an electrical conductor.
- 48, and 49, for wall mounted conduits.
- 95, and indented subclasses for conduits having plural channels or ducts.
- 98, for embedded conduits.

- 69 This subclass is indented under subclass 68.1. Structures constructed to be axially extensible. In some of these devices the structure causes the device normally to assume a coiled form.

- (1) Note. For extensible or elastic woven fabrics, see Class 139, Textiles: Weaving, subclasses 421+.
- (2) Note. See Class 191, Electricity: Transmission to Vehicles, subclasses 12+.

- (3) Note. See Class 267, Spring Devices.

SEE OR SEARCH CLASS:

343, Communications: Radio Wave Antennas, subclass 723, 823, 877, and 901+ for antennas which are adjustable in length.

70 This subclass is indented under subclass 68.1. Structures combined with things other than the conductors and the means for mounting and/or insulating the same in the conduit or cable, except those combinations provided for above in this class.

- (1) Note. Devices having special strands incorporated in armored or insulated cables or bare conductors for tension purposes are in this class, subclasses 102, 110 and 126.1 and their indented subclasses.
- (2) Note. The combination of a conduit, cable or conductor with means to couple the same to a box is in this class, subclasses 64 and 65.
- (3) Note. Compare this class, subclasses 135 and 136, for cable, conduit, or conductor accessories.
- (4) Note. Cables and conductors, having embodied in the structure thereof, non-current-carrying wires or elements or attaching means (other than mere armors or sheaths) specially designed to provide supporting or attaching means for the cables or conductors have been placed in this subclass.

71 This subclass is indented under subclass 70. Structures in which the conduit, cable or conductor has one or more branches or has means for connecting branches.

- (1) Note. For an electrical connector comprising an uninterrupted support rail or uninterrupted contact whereby a plurality of mating connectors may engaging at an infinite number of locations, Search Class 439, Electrical Connectors, subclasses 110+. For an electrical connector with a conduit or duct, Search Class 439,

subclasses 207+. For analogous structure to be used with vehicle structure, designed to permit motion of an electrical connector therealong, see Class 191, Electricity: Transmission to Vehicles, especially subclasses 23+.

- (2) Note. See Class 285, Pipe Joints or Couplings, appropriate subclasses, for pipe couplings providing branched pipes and conduits even though disclosed as being for electrical conductors. See Class 254, Pushing and Pulling Implements, subclasses 134.3+ for wire or strand placing means comprising guide means interior of a coupling.
- (3) Note. See Class 403, Joints and Connections, subclass 169 for branched connections in general.
- (4) Note. Compare Class 138, Pipes and Tubular Conduits, subclass 92.

72 This subclass is indented under subclass 71. Structures having (1) more than one branch or (2) having more than one duct.

- (1) Note. See Class 138, Pipes and Tubular Conduits, subclasses 111+ for plural duct pipe and tubular conduit structures not limited to electrical use.

73.1 With joint or end structure conductive stress distributing means:

This subclass is indented under subclass 70. Subject matter having conductive means to modify the electrical stress characteristics of the joint or end structure.

74 This subclass is indented under subclass 70. Structures claiming structure applied to the terminal end of a conductor, conduit or cable.

- (1) Note. See this class, subclasses 19 and 20, for end structures utilizing fluids.
- (2) Note. For housing type terminals having means for connecting the conduit or cable wires to other wires leading into the housing, see this class, subclass 60.
- (3) Note. See this class, subclasses 84+ for joints.

- (4) Note. See Class 439, Electrical Connectors, appropriate subclasses for electrical connector structure, and see especially subclasses 730, 754+, 775+, 865+, 874+, 877+, and 883 for an electrical connector of the terminal type usually applied to the end of a single conductor.
- SEE OR SEARCH CLASS:**
428, Stock Material or Miscellaneous Articles, subclass 583 for a metallic intermediate article which has a particular configuration at an end.
- 75** This subclass is indented under subclass 74. Structures in which there is a joint between the conductor within the end structure and some conductive element extending to the exterior of the end structure.
- 76** This subclass is indented under subclass 74. Structures filled with plastic material.
- (1) Note. See this class, subclasses 19 and 20, for end structures utilizing fluids.
- 77** This subclass is indented under subclass 74. Structures having means providing a tight seal between the end structure and the conductor element passing therethrough to the exterior thereof.
- 78** This subclass is indented under subclass 74. Structures provided with means to connect a ground wire thereto.
- (1) Note. See this class, subclass 51, for boxes or housings with grounding means.
- (2) Note. See Class 439, Electrical Connectors, subclasses 92+ for an electrical connector with circuit conductors and safety grounding provision.
- 79** This subclass is indented under subclass 74. Structures provided with means for attaching the same to a support.
- (1) Note. See this class, subclasses 37, 40 and indented subclasses, 48, 49, 58, and 63, for related supporting means.
- 80** This subclass is indented under subclass 74. Structures in which the end structure comprises one or more skirted insulator elements.
- (1) Note. For insulator structure, per se, see this class, subclass 137 and indented subclasses.
- 81** This subclass is indented under subclass 74. Structures in the form of an elbow, or having a hood over the conduit or cable end to cause the issuing conductors to bend.
- (1) Note. See Class 285, Pipe Joints or Couplings, subclasses 179.1+ for an elbow fitting having access means, and subclasses 179+ for an elbow pipe fitting.
- 82** This subclass is indented under subclass 74. Structures in the form of an end cap.
- (1) Note. Elbow form and hooded end caps are in this class, subclass 81.
- (2) Note. See Class 16, Miscellaneous Hardware, subclasses 108 and 109, for ferrules, rings and thimbles for conduits and cables, where characteristics restricted to electrical use are not claimed.
- 83** This subclass is indented under subclass 74. Structures of sleeve form for insertion into the ends of conduits and cables.
- (1) Note. See this class, subclasses 142, 143, 146, 152, 153, 154, 157, and 167, for related insulator structures.
- (2) Note. See Class 16, Miscellaneous Hardware, subclasses 2.1+, for bushings and lining thimbles for conduits and cables where characteristics restricted to electrical use are not claimed.
- 84** This subclass is indented under subclass 70. Structures claiming the joint between the ends of conduits, cables or conductors.
- (1) Note. Compare this class, subclass 75, for cable, conduit, or conductor end structures with joints.

- (2) Note. See this class, subclasses 21 and 22, for joints utilizing fluids.
 - (3) Note. See this class subclasses 71 and 72, for joints for associating conduits, cables or conductors in branching relation.
 - (4) Note. See Class 439, Electrical Connectors, for electrical connectors, generally, and see especially Lines With Other Classes and With This Class in that class (Class 439) definition for the line between this Class 174) and that class with regard to electrical joints.
 - (5) Note. See Class 285, Pipe Joints or Couplings, subclasses 47+ for joints or couplings heat and/or electrically insulated, having no added features limiting the same to electrical use.
 - (6) Note. See Class 403, Joints and Connections, appropriate subclasses, for conductor joints where no features restricting the same to the electrical arts, such as the use of insulation to insulate the conductively coupled wires or the structure of the conductor to improve the same for conducting electricity, are claimed. Features which are designed to make better metal to metal contact at the joint and thus improve the strength of the joint and also the electrical conductive properties have been placed Class 403.
 - (7) Note. See Class 156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 49 for methods of splicing indefinite length electric conductors.
- 85** This subclass is indented under subclass 84. Structures in which the joint is covered by a sleeve made in sections axially insulated from each other. This is usually for the purpose of causing sheaths or conduits of conductive material to be electrically noncontinuous at the joint.
- (1) Note. See Class 285, Pipe Joints or Couplings, subclasses 47+ for insulated pipe joints.
- 86** This subclass is indented under subclass 84. Joints made to be capable of moving or adjusting the sections connected by the joint to an out-of-line relation.
- (1) Note. See Class 138, Pipes and Tubular Conduits, subclass 120 for pipes having movable or adjustable sections.
 - (2) Note. See Class 285, Pipe Joints or Couplings, subclasses 121.3+ for concentric joints with relative motion, subclasses 121.6+ for coupling for plural noncommunicating lines with relatively motion, subclasses 144.1+ for serial relatively movable joints, and subclasses 184+ for a coupling providing an adjustable angle between the members.
 - (3) Note. See Class 403, Joints and Connections, subclasses 52+ for articulated joints in general.
- 87** This subclass is indented under subclass 84. Joints in which the joint connects the sections in other than a straight line.
- (1) Note. Compare this class, subclass 86.
- 88** This subclass is indented under subclass 84. Structures claiming joints between the separately insulated conductors of a plural conductor cable or conduit.
- (1) Note. Joints between single conductors of stranded form are in this class, subclass 90.
- 89** This subclass is indented under subclass 84. Joints in which the conduit wall or the cable sheath at the joint is radially spread or flanged, usually for better engagement with the joint sleeve or casing.
- 90** This subclass is indented under subclass 84. Joints having special features because of the stranded construction of the conductor.
- 91** This subclass is indented under subclass 84. Joints in which the encasing sleeve for the joint is made in at least two parts.

- (1) Note. See this class, subclass 85, for axially insulated joint sleeve sections.
- (2) Note. Compare this class, subclass 93, for sleeves provided with end caps.
- 92** This subclass is indented under subclass 91. Joints in which the sleeve is longitudinally divided, i.e., in a plane parallel to the axis.
- (1) Note. Compare Class 285, Pipe Joints or Couplings, subclasses 148.6+, 373 and 419, and Class 403, Joints and Connections, subclasses 309+.
- 93** This subclass is indented under subclass 84. Joints in which caps are provided at the ends of the sleeve to join the sleeve to the conduit or cable.
- 94** This subclass is indented under subclass 84. Joints between bare conductors.
- (1) Note. These devices claim, in addition to the joint, features of structure of the conductors restricting the same to the electrical art.
- (2) Note. See this class, subclass 84, (6) Note., for the line with Class 403, Joints and Connections.
- 95** This subclass is indented under subclass 68.1. Structures having two or more distinct ducts for receiving electrical conductors.
- (1) Note. Compare this class, subclass 104.
- (2) Note. See Class 138, Pipes and Tubular Conduits, subclasses 111+ for plural duct pipes and tubular conduits not structurally limited to electrical use.
- 96** This subclass is indented under subclass 95. Structures in which either the conductors in the ducts, or the ducts, are embedded in material.
- (1) Note. The material is usually granular or plastic in form.
- (2) Note. See this class, subclasses 98 and 118.
- 97** This subclass is indented under subclass 95. Structures in which the ducts are formed by grooves or channels in plates.
- (1) Note. See this class, subclass 101, for other removable wall conduits.
- (2) Note. See Class 138, Pipes and Tubular Conduits, subclasses 111+ particularly subclasses 115-117, for plural duct pipes and tubular conduits in which the ducts are formed by grooves or channels in plates.
- 98** This subclass is indented under subclass 68.1. Structures in which either the conduit or the conductor in the conduit is embedded in material.
- (1) Note. The material is usually plastic or granular.
- (2) Note. See this class, subclasses 96 and 118.
- 99** This subclass is indented under subclass 68.1. Structures in which the conduit has supports in its interior for supporting one or more conductors.
- (1) Note. Complete the search in this class, subclass 98, and in Class 138, Pipes and Tubular Conduits, subclass 108 for conduits for supporting one or more conductors therein; and subclass 113 for conduits for supporting one or more pipes therein.
- (2) Note. See this class, subclasses 28 and 29, for coaxial or concentric conductor type of structure.
- (3) Note. See this class, subclass 131, for plural strand conductors with interior means to hold the conductors.
- (4) Note. See this class, subclasses 146 and 147, for mid-line spacer type of insulators.
- (5) Note. For similar structures in which the supporting means consists of relatively short insulating elements, such as but-

tons, discs, plates or beads, strung along or upon the conductors, see this class, subclass 111.

- (6) Note. See Class 405, Hydraulic and Earth Engineering subclasses 132+ for tunnels and subways with supporting means.
- (7) Note. See Class 104, Railways, subclass 140 and indented subclasses, for railway slotted conduits, and subclass 173 and indented subclasses, for railway cable traction conduits.
- (8) Note. See Class 191, Electricity: Transmission to Vehicles, subclass 23 and indented subclasses, for conduit enclosed and supported conductors specially arranged to transmit to vehicles.
- (9) Note. See Class 313, Electric Lamp and Discharge Devices, subclasses 274+, for electric lamps which have an envelope, generally of elongated tubular shape, and a filament which extends the length of the envelope, the envelope having supports in its interior for supporting the filament.
- 100** This subclass is indented under subclass 99. Structures specially designed to support conductors or cables in a vertical position.
- 101** This subclass is indented under subclass 68.1. Structures having at least one wall removable.
 - (1) Note. Complete the search in this class, subclass 97, for conduits formed for grooved or channeled plates either stacked or having a removable wall.
 - (2) Note. See Class 138, Pipes and Tubular Conduits, subclasses 157+ for pipes having at least one wall removable.
- 101.5** This subclass is indented under subclass 68.1. Structures constructed to float on water.
 - (1) Note. Structures herein usually include tubes or cells filled with a light weight fluid or a vacuum.

SEE OR SEARCH THIS CLASS, SUBCLASS:

8+, for structures utilizing a fluid or vacuum for other purposes.
126.1+, for mere hollow conductors.

- 102** This subclass is indented under subclass 68.1. Structures in which one or more conductors are enclosed in, but insulated from, an electrically conductive armor or sheath.
 - (1) Note. An armor or sheath as used herein includes any surrounding conduit, tube, wrapping, winding, layer, coating, or other enclosing structure. Such structures may be inherently conductive, as when made of metal, or may be rendered conductive by incorporation of conductive ingredients or particles.
 - (2) Note. While the conductivity of the armor or sheath is essential to cause classification in this subclass and indented subclasses, it is not necessary that the armor or sheath be intended to carry an electric current. Thus, this subclass and indented subclasses include, for example, armors or sheaths (a) provided solely for mechanical protection when claimed as made of conductive material, and (b) having an electrical function such as corona prevention, grounding, shielding, etc., or constituting the outer conductor of a coaxial or concentric type cable.
 - (3) Note. For structures employing anti-inductive means in addition to the conductor armor or sheath, see this class, subclass 32 and indented subclasses, especially subclass 36.
 - (4) Note. For conductively armored or sheathed conductors or cables employing a fluid or vacuum, see this class, subclass 8 and indented subclasses, especially subclass 24 and indented subclasses. See particularly subclasses 28 and 29 for coaxial or concentric type cables.
 - (5) Note. For conductors or cables armored or sheathed solely by insulation, see this

class, subclass 110 and indented subclasses.

- (6) Note. For mere hollow conductors not forming an enclosure for another conductor, see this class, subclass 126.1 and indented subclasses, especially subclasses 130 and 131.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclasses 243+ for long transmission lines of the shielded type having distributed electrical parameters.

338, Electrical Resistors, subclass 214 for cable type resistors, subclasses 226+ for an incased, embedded or housed fixed electrical resistor, especially subclasses 238+ and 243+ for electrical resistance elements in insulation with an outer metallic sheath. See the class definition under Class 338 for certain classification lines relating to this subject matter.

428, Stock Material or Miscellaneous Articles, subclass 620 for composite metallic stock having a semiconductor component.

- 103** This subclass is indented under subclass 102. Structures in which two or more conductors or groups of conductors are separately enclosed in a conductive armor or sheath.

- 104** This subclass is indented under subclass 103. Structure in which the conductive armor or sheath comprises a body having individual passages for the conductors or groups of conductors. Said body may be preformed or may be molded directly about the conductors.

- (1) Note. Compare this class, subclass 95 and indented subclasses, for conductors or cables arranged in plural-duct conduits.

- (2) Note. Compare this class, subclasses 96 and 98, for single or plural conductors embedded in plastic or other material.

- 105** This subclass is indented under subclass 102. Structures having two or more substantially coaxial, conductive armors or sheaths insulated from one another.

SEE OR SEARCH CLASS:

428, Stock Material or Miscellaneous Articles, subclass 624 for a metallic composite having an additional organic component.

- 106** This subclass is indented under subclass 102. Structures having two or more substantially coaxial, conductive armors or sheaths in conductive contact with one another. This includes composite armors or sheaths comprising two or more conductive layers or coating conductively engaging one another.

SEE OR SEARCH CLASS:

428, Stock Material or Miscellaneous Articles, subclass 604 for metallic stock or corrugate configuration, and subclasses 615+ for composite metallic stock defined in terms of the composition of its components.

- 107** This subclass is indented under subclass 102. Structures in which the conductive armor or sheath is enclosed in a wrapping, coating, or other body of nonconductive material, to insulate the armor or sheath or to protect it against corrosion, deterioration, or other damage.

- 108** This subclass is indented under subclass 102. Structures in which the armor or sheath comprises a conductive tape, strip, wire, or other element applied spirally.

- (1) Note. See Class 138, Pipes and Tubular Conduits, subclasses 130, 133 and 134+ for flexible pipes formed of spirally wound metallic elements; and subclasses 144, 150 and 154 for other pipes formed of spirally wound metallic elements.

SEE OR SEARCH CLASS:

428, Stock Material or Miscellaneous Articles, subclass 592 for metallic stock which is helical or has a helical component.

- 109** This subclass is indented under subclass 108. Structures in which the successive turns of the spirally applied armor or sheath overlap or are interlocked with one another.
- 110** This subclass is indented under subclass 68.1. Structures pertaining to the insulation of electric conductors or cables.
- (1) Note. See Lines With Other Classes, Miscellaneous, above.
 - (2) Note. For insulated conductors or cables enclosed in conductive armors or sheaths, see this class, subclass 102 and indented subclasses.
 - (3) Note. For conduit, cable and conductor structures involving fluid insulation, see this class, subclass 24 and indented subclasses.
 - (4) Note. For insulator structures, see this class, subclass 137 and indented subclasses.
 - (5) Note. For structures under subclass 68.1 in which the conductors or cables are insulated by being embedded in plastic or granular material, other than mere coating, see this class, subclasses 96 and 98.
 - (6) Note. For conduits having insulating supports for supporting the conductors or cables therein, see this class, subclass 99.
 - (7) Note. For insulating structures under subclass 68.1 having two or more distinct ducts for receiving the conductors, see this class, subclasses 95, 96 and 97.
 - (8) Note. For uninsulated conductors or cables, see this class, subclass 126.1 and indented subclasses.
 - (9) Note. For insulating materials, per se, see the appropriate fabric or composition classes. In addition to those search notes associated with Lines With Other Classes, Miscellaneous, in the class definition, the following are particularly noted; Class 154, Laminated Fabric and Analogous Manufactures, especially subclass 2.6, Class 156, Adhesive bonding and Miscellaneous Chemical Manufacture, subclasses 51+ for methods of covering indefinite length electric conductors and Class 162, Paper Making and Fiber Liberation, especially subclass 106.
- SEE OR SEARCH CLASS:**
- 338, Electrical Resistors, subclass 214 for cable type resistors, subclasses 226+ for an incased embedded or housed resistor, and especially subclasses 238+ and 243+ for electrical resistance elements in insulation with an outer metallic sheath. See the class definition under Class 338 for certain classification lines relating to this subject matter.
- 428, Stock Material or Miscellaneous Articles, subclass 624 for a metallic composite having an additional organic component.
- 111** This subclass is indented under subclass 110. Structures in which the insulating means includes relatively short insulating elements in the form of buttons, plates, discs, beads, etc., strung along or upon one or more conductors or cables.
- (1) Note. For similar structures in which the buttons, discs, beads, etc., are specially designed or arranged to provide spaces for a fluid, see this class, subclass 24 and indented subclasses, especially subclass 28.
 - (2) Note. For bead or disc type insulators specially designed as mid-line spacers, see this class, subclass 146.
- 112** This subclass is indented under subclass 110. Structures in which the conductors or their insulation is provided with distinctive markings or other means for identifying the individual conductors.
- (1) Note. Compare this class, subclass 115, for multiple conductor structures in which one or more of the conductors differ from the others in size, shape, insula-

- tion, for other characteristics for some special purpose other than or additional to mere identification.
- 113** This subclass is indented under subclass 110. Structures embodying two or more conductors insulated from one another.
- (1) Note. For multiple conductor structures in which one of the conductors encloses or surrounds another as, for example, in coaxial or concentric type cables, see this class, subclasses 28, 29 and 102 and indented subclasses.
- 114** This subclass is indented under subclass 113. Structures in which two or more mutually insulated conductors, or conductive strands, are specially designed to function as a single conductor carrying the same current. The insulation between such conductors is ordinarily superficial.
- 115** This subclass is indented under subclass 113. Structures in which one or more of the conductors differ from the other in size, shape, insulation, or other characteristics for some special purpose or function such as, testing, signaling, grounding, etc.
- (1) Note. Where the conductors have distinguishing characteristics solely for identification purposes, see this class, subclass 112.
- (2) Note. Coaxial or concentric type cables are in this class, subclasses 28, 29 and 102 and indented subclasses.
- (3) Note. For multiple conductor structures in which one or more of the conductors differ from the others for anti-inductive purposes, see this class, subclass 32 and indented subclasses.
- 116** This subclass is indented under subclass 113. Structures in which the spaces or valleys between adjacent conductors, which may be laid parallel or twisted, contain filler insulation. Such filler insulation is usually of preformed strips or strands, and together with the conductors forms an assembly having a circular or other desired cross-section.
- 117** This subclass is indented under subclass 113. Structures in which the conductors and insulation are arranged to form an assembly of non-circular cross-section.
- (1) Note. A twisted pair has been treated as of circular section.
- (2) Note. For single conductors embodying plural strands arranged in noncircular formation, see this class, subclasses 119 and 129.
- (3) Note. Noncircular assemblies employing filler insulation are placed in this class, subclass 116 and cross-referenced here.
- 118** This subclass is indented under subclass 110. Single conductor structures including as a part thereof a material in powdered or granular form. The material may be either conductive or nonconductive.
- (2) Note. For material in fluid form, see this class, subclass 8 and indented subclasses.
- (3) Note. Compare this class, subclasses 96 and 98, for the use of powdered or granular material to embed conduits or ducts, or to embed conductors in conduits or ducts.
- SEE OR SEARCH CLASS:**
75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 228+ for a composition having a continuous phase of free metal made by consolidating metal particles.
- 119** This subclass is indented under subclass 110. Single conductor structures in which the conductor (a) is made of two or more materials, not mere constituents of a single composition or alloy, or (b) is of noncircular cross-section. The conductor may be either single or plural strand.

- (1) Note. For bare composite conductors, see this class, subclass 132.
 - (2) Note. For bare noncircular conductors, see this class, subclasses 129 and 133.
 - (3) Note. For noncircular assemblies of two or more conductors, see this class, subclass 117.
- 120** This subclass is indented under subclass 110. Single conductor structures in which the insulation includes (a) two or more layers of insulating material or (b) a single insulating layer impregnated with a composition of matter.
- (1) Note. In this subclass have been placed all structures within the above definition in which any insulating layer is other than fibrous, or fabric, or plastic, or coating material. For definitions of these terms, see the notes to subclass 121 of this class.
 - (2) Note. Where one of the layers comprises a material in powdered or granular form, see this class, subclass 118.
 - (3) Note. See Class 428, Stock Material or Miscellaneous Articles, subclasses 380+ for an insulated conductor which is no more than a wire or filament with a plurality of layers of coating materials thereon.
- 121** This subclass is indented under subclass 120. Structures in which (a) one layer is fibrous or fabric and a contiguous layer is plastic or coating material, or (b) a fibrous or fabric layer is impregnated with a composition of matter.
- (1) Note. Fibrous or fabric, as used herein, means any material or textile composed of fibres and includes, for example, preformed paper or paper pulp, asbestos, feathers, spun glass, cotton, and wool.
 - (2) Note. Plastic or coating material, as used herein, means those compositions, either natural or synthetic, in plastic or liquid form, capable of being applied by ordinary molding or coating processes. Such compositions may have commi-
- nuted material of any character as a constituent thereof. Examples of materials of this type are glass and rubber.
- (3) Note. Preformed tapes, strips, or sheets of rubber, mica, bamboo, or synthetic materials, such as regenerated cellulose, are not considered as fibrous, fabric, plastic or coating material, and conductors insulated by such elements have been placed in subclass 110 of this class, when such material constitutes the only layer, or in subclass 120 when there are additional layers of other material. See note (1) to subclass 120.
 - (4) Note. See this class, subclass 102 and indented subclasses, for coverings consisting of fibrous or fabric material coated or impregnated with conductive material.
- 122** This subclass is indented under subclass 120. Structures in which each insulating layer consists of nonimpregnated fibrous or fabric material as defined in note (1) of subclass 121.
- (1) Note. Where any one of such layers is impregnated, the patent will be placed in this class, subclass 121.
 - (2) Note. For single, nonimpregnated, fibrous or fabric layers, see this class, subclass 124.
 - (3) Note. All patents having claims to two or more contiguous nonimpregnated, fibrous or fabric layers are to be cross-referenced here.
- 124** This subclass is indented under subclass 110. Single conductor structures having a single insulating layer, which layer consists of a nonimpregnated fibrous or fabric material as defined in note (1) to subclass 121.
- (1) Note. Continue the search in this class, subclasses 121 and 122.
 - (2) Note. See note (9) to subclass 110 of this class.

125.1 Superconductor:

This subclass is indented under subclass 68.1. Structures pertaining to cables or conductors formed in whole or in part of superconductive material for use as a superconductor.

SEE OR SEARCH CLASS:

- 29, Metal Working, subclass 599 for general methods of making superconductors.
- 420, Alloys or Metallic Compositions, subclass 901 for superconductive compositions.
- 427, Coating Processes, subclasses 62+ for methods of making superconductors which involve a coating process.
- 428, Stock Material or Miscellaneous Articles, subclass 930 for superconductive metallic stock material.
- 505, Superconductor Technology: Apparatus, Material, Process, particularly subclasses 230+ for high temperature (greater than 30 K) superconducting wire, tape, cable, or fibers, and art collection subclass 887 for superconductors operating at or below 30 K.

126.1 Conductor structure:

This subclass is indented under subclass 68.1. Structures pertaining to the form, shape or other characteristic of an uninsulated conductor.

- (1) Note. See the main class definition, References to Other Classes, for the line between conductors of this class and those properly placed elsewhere.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 15.5, for superconductive apparatus with provision for cooling.
- 102+, for hollow conductors which constitute armors or sheaths for other conductors.
- 110+, for insulated conductors.
- 125.1, for structure of superconductors.

SEE OR SEARCH CLASS:

- 191, Electricity: Transmission to Vehicles, subclass 13 for conductors in the form of sheets or plates.

- 343, Communications: Radio Wave Antennas, subclass 908 for conductors which are active antenna components of any particular shape.

- 428, Stock Material or Miscellaneous Articles, subclasses 544+ for stock materials, e.g., of indefinite length, which are all metal or which have adjacent metal components even though claimed as being electrical conductors.

126.2 Composite:

This subclass is indented under subclass 126.1. Structures in which the conductor is made of at least two distinct layers of different conductive materials.

126.3 Corrugated or slotted:

This subclass is indented under subclass 126.1. Structures in which the conductor has an undulating shape either on two opposed surfaces (corrugated) or on one surface only (slotted).

126.4 Metal coated on insulation:

This subclass is indented under subclass 126.1. Structures in which the conductor is a conductive (metal) layer (coating) on the surface of an insulative core.

- 127 This subclass is indented under subclass 126.1. Structures specially designed to prevent formation of corona discharges, i.e., to prevent high electro-static stress at any point.

128.1 Plural strand:

This subclass is indented under subclass 126.1. Structures in which two or more strands, either simple or composite, are assembled to form a single conductor structure.

- (1) Note. See References to Other Classes to the main class definition of this class for the line between this class and the various textile classes.

- (2) Note. Search should be completed in Class 57, Textiles: Spinning, Twisting, and Twining, subclasses 200+.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 114, for conductor structures comprising plural strands insulated from one

another but intended to carry the same current and to function as a single conductor.

SEE OR SEARCH CLASS:

313, Electric Lamp and Discharge Devices, subclass 343 for plural strand conductors used as filaments in electric lamps or discharge devices.

128.2 Bundle conductors:

This subclass is indented under subclass 128.1. Structures in which the strands are insulated from one another by an air space but are intended to carry the same current and to function as a single conductor.

129 This subclass is indented under subclass 128.1. Structures in which the strands are arranged to form a conductor having a noncircular cross-section.

- (1) Note. For two or more insulated conductors assembled to provide a structure of noncircular cross-section, see this class, subclass 117.
- (2) Note. For single, insulated conductors either single or plural strand, of noncircular cross-section, see this class, subclass 119.
- (3) Note. For uninsulated single strand conductors of noncircular cross-section, see this class, subclass 133.

130 This subclass is indented under subclass 128.1. Structures in which the strands are arranged to form a conductor which is annular in cross-section.

- (1) Note. For similar structures constituting an armor or sheath, see this class, subclass 102 and indented subclasses, especially subclass 108.

131 This subclass is indented under subclass 130. Structures in which the wall of the annulus is reinforced or supported by means located within the annulus.

- (1) Note. When the reinforcing means is conductive it must be of a form to leave

the annulus substantially hollow. When nonconductive it may fill the annulus.

SEE OR SEARCH THIS CLASS, SUBCLASS:

101.5, for buoyant cable structures having interior wall supports.

133 This subclass is indented under subclass 126.1. Single strand structures having a cross-section other than circular.

- (1) Note. Continue the search in this class, subclass 119.
- (2) Note. For plural strand assemblies of noncircular cross-section, see this class, subclass 129.

135 This subclass is indented under subclass 68.1. Miscellaneous devices, not otherwise classified, for use with conductors .

- (1) Note. Compare this class, subclass 70.
- (2) Note. For conductor vibration dampers, see this class, subclass 42, and the notes thereunder.
- (3) Note. For conductor take-ups in the form of reels, see Class 191, Electricity: Transmission to Vehicles, subclass 12 and indented subclasses, and Class 242, Winding, Tensioning, or Guiding, subclasses 370+.
- (4) Note. For other take-up devices, see Class 24, Buckles, Buttons, Clasps, etc., especially subclass 115 and indented subclasses, for cord adjusters, and Class 267, Spring Devices, especially subclass 69 and indented subclasses, for spring devices.

136 This subclass is indented under subclass 135. Devices generally tubular in form, adapted to be placed around one or more conductors, and supported by the latter, to prevent an adjacent structure, such as a tree, from injuring the conductor or its insulation. The device is usually but not necessarily, formed at least in part of insulating material.

- (1) Note. Compare this class, subclass 147, for mid-line spacers designed to prevent contact between two or more conductors which cross one another.
- (2) Note. For similar structures designed to be placed about conductors for preventing accidental contact therewith by persons or animals, see this class, subclass 5.
- (3) Note. For similar structures designed to protect flexible hose, rope, etc., from wear and abrasion, see Class 138, Pipes and Tubular Conduits, subclass 110, and Class 384, Bearings, subclass 24.
- (4) Note. For bushings or lining thimbles, ferrules and rings having means for preventing abrasion of elements passing therein or therethrough but not limited to use with electric conduits, see Class 16, Miscellaneous Hardware, subclasses 2.1+ 108, and 109.
- 137** This subclass is indented under the class definition. Devices for electrically insulating one or more conductors or other articles or structures from one another or from a supporting structure or ground.
- (1) Note. An insulating device within the meaning of this class may include in addition to the insulating body, per se, the necessary attachments or fittings for mounting or supporting the insulator or for securing a conductor or other article thereto.
- (2) Note. See this class, subclass 8 and indented subclasses, particularly subclasses 30 and 31, for insulating devices utilizing fluids; subclass 40 and indented subclasses, for overhead installations, and subclass 68.1 and indented subclasses, particularly subclass 110 and indented subclasses, for insulated conductors.
- (3) Note. Insulating devices limited by structure to use with particular art devices or claimed in combination with significant structure thereof will be found in the appropriate art classes. See Search Class below for those classes particularly noted.
- (4) Note. For dielectric materials see Notes (1), (1.5), (2), and (3), (3.1) and (3.5) of the class definition of this class, and the classes listed therein, and also Class 156 Adhesive Bonding and Miscellaneous Chemical Manufacture, appropriate subclasses for laminated insulation fabrics and Class 162, Paper Making and Fiber Liberation, for paper.
- (5) Note. For conductor or cable supports not claimed of insulating material, or otherwise restricted by electrical limitations, such as arcing devices, grounding means, etc., see Class 248, Supports, subclass 49 and indented subclasses.
- SEE OR SEARCH CLASS:**
- 16, Miscellaneous Hardware, subclasses 18+, for insulating casters, and subclasses 431+, for insulated handles.
- 52, Static Structures (e.g., Buildings), subclasses 408+ for a disparate sheet lamina between components of an in-situ construction and having no defined electrical significance except insulation in general.
- 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 228+ for a composition having a continuous phase of free metal made by consolidating metal particles.
- 105, Railway Rolling Stock, subclass 60, for electric locomotive insulation.
- 238, Railways: Surface Track, subclass 107 and 108, for railway tie insulation, and subclass 152 and indented subclasses, for insulated rail joints.
- 248, Supports, subclass 345, for canopy insulators.
- 285, Pipe Joints or Couplings, subclasses 47+ for insulated pipe joints and couplings; and also the classes listed in note (4) of subclass 123.14 of this class.

- 138** This subclass is indented under subclass 137. Insulating devices for supporting and/or insulating particular articles or structures other than conductors.

(05.) Note. This subclass includes insulated rod joints not otherwise classified. Where the insulated rod joint is merely two or more rod-like bodies which are insulated from each other by means of insulating material which is joined to the rod-like bodies by means of bonded joint, the patent is classified in 403, Joints and Connections, appropriate subclasses, especially subclasses 265+, for molded joints. A bonded joint is a joint where the parts are held together by means of solder, welding material, cement or other adhesive, or by the materials adhering directly with each other.

- (1) Note. See note (3) subclass 137 of this class.
- (2) Note. Insulating elements adapted for insertion between the links of pull chains for switches are placed in this subclass, but where such element constitutes a handle or pull knob for the chain, classification is in Class 16, Miscellaneous Hardware, subclass 442.
- (3) Note. For insulating devices specially designed to prevent persons or animals from receiving electrical shocks, see this class, subclass 5.
- (4) Note. Insulating elements which are constituent parts of electrical apparatus or devices and are specially designed for use therein will be found in the appropriate class for such apparatus or device, even though claimed, per se. For example, see: Classes 191, Electricity: Transmission to Vehicles, subclass 39, for section insulators and subclass 42 for combined ears and insulators; 200, Electricity: Circuit Makers and Breakers, subclass 168, for switch and fuse mountings and base; 310, Electrical Generator or Motor Structure, subclasses 233+ for commutators having insulation for por-

tions thereof; 313, Electric Lamp and Discharge Devices, subclasses 238+, for electric lamps and electric space discharge devices which are provided with insulators for supporting or spacing the electrodes of an electric lamp and electric space discharge device, see subclass 340 for indirectly heated cathodes for electric lamps and electric space discharge devices which are provided with an insulator for spacing the heater element from the cathode member; and 338, Electrical Resistors, for electrical resistance element cores and frames which constitutes part of the electrical resistor (see also (1) Note under subclass 321). Insulators, per se, for use in the devices of Class 313 and which are of general utility are in this subclass of Class 174. See subclass 292 of Class 313 for miscellaneous supporting and spacing elements for use in the devices of Class 313 and which are not otherwise classified. See Class 439, Electrical Connectors, appropriate subclasses for insulating contact bases, lamp sockets or other elements of connectors and appurtenant devices of insulating materials and not elsewhere classifiable. See Class 336, Inductor Devices, especially subclasses 198, 206, 209, and 219 for coil, inductance, magnetic core and transformer insulation. See Class 337, Electricity: Electrothermally or Thermally Actuated Switches, appropriate subclasses for specific switches of the electrothermal or thermal type with mountings or bases.

- (5) Note. Insulating supports for neon tubes are placed in this subclass. For similar supports not claimed as made of insulation, see Class 248, Supports, subclass 50.
- (6) Note. Fastening devices such as bolts, rivets, etc., having means for insulating the same from a structure penetrated by the fastening device, are in this subclass.

SEE OR SEARCH CLASS:

373, Industrial Electric Heating Furnaces, subclasses 128+.

139 This subclass is indented under subclass 137. Insulating devices combined with things other than the insulating body, its supporting or attaching means, terminal elements, and conductor holding means, except those combinations provided for above in this class. This includes, for example, guards and other protective devices for preventing mechanical injury to the insulating body, connectors for connecting two or more conductors supported by the insulator, heating devices for preventing condensation of moisture and other devices for improving the electrical efficiency of the insulator.

- (1) Note. For multi-part or composite insulators, or insulators having coatings of other insulating material, or having metallic or nonmetallic reinforcing elements embedded therein, see this class, subclasses 178 and indented subclasses, 181, 195, 209, and 210.
- (2) Note. For insulators having terminal means providing for ventilation thereof, see this class, subclass 187.
- (3) Note. For trolley guards, see Class 191, Electricity: Transmission to Vehicles, subclass 35.

140 This subclass is indented under subclass 139. Insulating devices combined with conductive means to modify the electrical characteristics of the insulator. This includes, for example, arcing horns or electrodes, conductive coating or elements for modifying surface resistance or preventing concentration of stress, and conductive grading means for controlling the voltage gradient.

- (1) Note. Electric condensers or capacitors are in Class 361, Electricity: Electrical Systems and Devices, subclasses 271+, but mere insulators having condenser elements for modifying the capacity thereof, or for distributing the stresses therein, are in this class (174).
- (2) Note. Lightning arresters, arc and spark gaps, and other overvoltage protective means are in Class 361, Electricity: Electrical Systems and Devices, sub-

classes 212+, and in Class 313, Electric Lamp and Discharge Devices, appropriate subclasses even though the structure of the lightning arrester, arc or spark gaps includes insulating means to separate the electrodes of the device from each other. Insulator structures which are primarily designed for spacing one or more conductors or other articles or structures, other than mere arc or spark gap terminals, from one another or from a supporting structure or ground when designed to permit overvoltage discharges, or when combined with arcing or sparking electrodes constituting a part of or secured to the insulator or its terminals or fittings for the purpose of protecting the insulator from the effects of the overvoltage discharge, are in this class (174). Where additional means are provided (such as fuses, resistors, etc.) for controlling or suppressing the arc or overvoltage, classification is in Class 361. Where the structure claimed of is intended for use establishing an electric space discharge between the electrodes of the arc or spark gap, and the insulator is provided merely to insulate the electrodes from each other, the patent is classified in Class 313. Arcing or grading devices, per se, which are specially designed for use with the insulators of Class 174, are in this class (174), subclass 144. Mere arc spark or other electric space discharge device electrodes, which are not limited to use with the insulators of class 174, are in Class 313, subclasses 326+. See subclass 313 of Class 313 for electric lamps and electric space discharge devices which are provided means for preventing the accumulation of static charges upon parts of the device or for preventing undesired electric space discharges, such as arcs, between the parts of the device.

- (3) Note. For conduit, cable or conductor joints or end structures combined with conductive stress distributing means, see this class, subclass 73.1.
- (4) Note. For X-ray devices having electrostatic field stress distributing means, see

Class 378, X-Ray or Gamma Ray Systems or Devices, subclass 139.

- (5) Note. For inductor devices with coil capacitance modifying means to change the potential gradient in order to minimize surge or transient effects, see Class 336, Inductor Devices, subclass 70.

SEE OR SEARCH CLASS:

343, Communications: Radio Wave Antennas, subclass 885 for antennas with a support having stress distributing or static discharging means in the support.

- 141** This subclass is indented under subclass 140. Structures in which the insulator consists of two or more separate insulating units arranged in series between the structures to be insulated.

- (1) Note. For insulator strings and stacks, per se, see this class, subclass 150.

- 142** This subclass is indented under subclass 140. Structures in which the insulator is of the type for insulating a conductor from a wall or plate through which the conductor extends.

- (1) Note. For bushing type insulators, per se, see this class, subclasses 151 and indented subclasses, and 167.

- 143** This subclass is indented under subclass 142. Structures in which alternating rings or cylinders of conductive and insulating material are arranged between the conductor and the wall or plate.

- (1) Note. See note (1) to the definition of subclass 140 of this class.

SEE OR SEARCH CLASS:

216, Etching a Substrate: Processes, subclass 6 for the formation of a capacitor using etching in the process.

- 144** Arcing or grading rings or devices, per se, specially designed for use with insulators.

- (1) Note. See note (2) to the definition of subclass 140 of this class.

- (2) Note. For arcing rings or devices, per se, see the reference to Class 313, Electric Lamp and Discharge Devices, under "SEARCH CLASS" in (2) Note to the definition of subclass 140 of Class 174.

- 145** This subclass is indented under subclass 139. Devices combined with means for electrically connecting two or more conductors.

SEE OR SEARCH CLASS:

439, Electrical Connectors, appropriate subclasses for an electrical connector, generally, including the combination of a conductor therewith, and see the notes set forth in sections IV and VI in the definition of that class (Class 439) for distinctions between Class 174 and Class 439.

- 146** This subclass is indented under subclass 137. Insulating devices for spacing or separating two or more conductors at a point intermediate the supports for said conductors.

- (1) Note. For similar devices for spacing plural conductors in conduits, see this class, subclass 99.

- (2) Note. For strand spacing devices formed of conducting material, see this class, subclass 128.1 and indented subclasses.

- 147** This subclass is indented under subclass 146. Devices for spacing or separating the conductors at a point where they cross one another.

- (1) Note. For spacing devices of this character designed to effect transposition of the conductors for anti-inductive purposes, see this class, subclass 33.

- (2) Note. For devices applied to one conductor for preventing wear or abrasion caused by a second conductor or other object which crosses the first, search this class, subclass 136.

- (3) Note. For similar devices specially designed for use with trolley conductors, see Class 191, Electricity: Transmission to Vehicles, subclass 37.

148 This subclass is indented under subclass 137. Combinations of two or more insulators, each of which constitutes a substantially complete insulating device capable of independent use as such.

- (1) Note. Mere divided, sectional, or multi-part insulators in which two or more insulating elements constitute complementary parts of a single insulating device are not included here and will be found in the subclasses indicated in the following notes.
- (2) Note. Divided insulators are in this class, subclasses 155, 156 and 157.
- (3) Note. Sectional, multi-part, and composite insulators are in this class, subclasses 178 and indented subclasses, 195, 209 and 210.
- (4) Note. Mere supports for plural insulators, such as plural brackets, etc., not claimed in combination with the insulators nor otherwise restricted to use with electric conductors have been placed in Class 248, Supports, subclass 49 and indented subclasses, particularly in subclasses 67.7 and 68.1.
- (5) Note. For plural supports in general, see Class 211, Supports: Racks.
- (6) Note. For plural insulator assemblies claimed in combination with a pole, tower, or other overhead installation, see this class, subclass 40 and indented subclasses.

149 This subclass is indented under subclass 148. Structures designed for supporting two or more conductors or cables in spaced relationship.

150 This subclass is indented under subclass 148. Structures in which all of the insulators are arranged in a series between the conductor and a supporting structure.

- (1) Note. For strings and stacks combined with arcing or conductive stress distributing means, see this class, subclass 141.

- (2) Note. Multiple insulator assemblies in which some of the insulators are arranged in series, and some are not, have been placed in this class, subclass 148 or 149, and cross-referenced here when necessary.

151 This subclass is indented under subclass 137. Devices for insulating a conductor from a wall or plate through which the conductor extends.

- (1) Note. For such devices combined with or utilizing a fluid, see this class, subclass 31.
- (1.3) Note. For hermetically sealed envelopes of the type used for electric lamps and electric space discharge devices which have a metallic wall portion with a lead-in conductor which passes through and is insulated from the metal wall portion, and where structure of the envelope in addition to the bushing structure is recited, see subclass 50.56 of this class.
- (1.5) Note. For the miscellaneous boxes and housings with bushings where structure in addition to the bushing structure is involved, and for the miscellaneous boxes and housings with means to couple a cable, wire or conduit to the box or housing, see subclass 65 of this class.
- (2) Note. For such devices combined with conductive arcing or stress distributing means, see this class, subclasses 142 and 143.
- (3) Note. For mere tubular or spool-type insulators not limited to use with a wall or plate, or combined in combination therewith, see this class, subclass 167 and the notes thereto.

SEE OR SEARCH CLASS:

343, Communications: Radio Wave Antennas, particularly subclasses 713+ for antennas with a vehicle wherein the antenna or its lead-in conductor is supported by, and may extend through and be insulated from, the vehicle body; and subclasses 888+ for antennas with a support for sup-

- porting the rod-like end portion of the antenna which may extend through and be insulated from a wall or plate.
- 152** This subclass is indented under subclass 151. Devices in which a portion of the insulating element extends into the opening in the wall or plate.
- (1) Note. Class 174 provides for portions of a complete electrical bushing when there is no provision for the claimed subject matter in any other class (e.g., only electrical bushing structure of a spark plug, a lead-in wire of an electrical bushing as an electrode or center electrode, etc.).
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 74+, for an insulating bushing limited by structure to use with the end structure of a conduit, cable, or conductor, especially subclass 83 for conduit-end lining thimbles.
- 138, for an insulated rod joint.
- 154+, for tubular or spool-type insulator mounted in a supporting bracket or holder.
- SEE OR SEARCH CLASS:
- 16, Miscellaneous Hardware, subclasses 2+ for a bushing or lining thimble not limited to use with electric conductors.
- 220, Receptacles, subclasses 3.5+ for wall, floor, or panel mounted outlet or junction boxes.
- 248, Supports, subclasses 27.1+, for an instrument mounted in a panel and subclasses 56+ for a pipe or cable extending through a plate.
- 277, Seal for a Joint or Juncture, for a generic sealing means or process, subclass 606 for a static seal for a pipe, conduit, or cable, and a wall, subclass 919 for a seal including an electrical feature.
- 285, Pipe Joints or Couplings, subclasses 189+ for a pipe and plate joint.
- 313, Electric Lamp and Discharge Devices, subclasses 118+ for a spark plug having a bushing including a ground electrode point and an insulated electrode point.
- 362, Illumination, subclass 456 for plates for mounting lenses.
- 403, Joints and Connections, subclasses 230+ for a rod end transverse to a side or plate.
- 439, Electrical Connectors, subclasses 571+ for an electrical connector mounted or attached to a wall, plate, or panel.
- 153** This subclass is indented under subclass 152. Devices in which the bushing is secured in the wall or plate by means located upon and engaging opposite sides of said wall or plate.
- 154** This subclass is indented under subclass 137. Insulators mounted in a ring, clamp, or other holder which embraces or surrounds both the insulator, and the conductor held thereby.
- (1) Note. Compare this class, subclass 151 and indented subclasses, for bushing type insulators mounted in walls or plates.
- (2) Note. For pipe and cable holders having rings, clamps, etc., embracing the pipe or cable and not limited to use with electric conductors or combined with insulators, see Class 248, Supports, subclass 49 and indented subclasses.
- 155** This subclass is indented under subclass 154. Devices in which the insulator is formed of two or more insulating parts assembled to provide a passage for receiving the conductor, or for clamping the conductor therebetween.
- (1) Note. For other divided insulators, see this class, subclasses 156 and 157.
- 156** This subclass is indented under subclass 137. Insulators formed of two or more insulating parts assembled to provide one or more passages for receiving conductors, or for clamping the conductors therebetween.
- (1) Note. For mere multi-part or sectional insulators not assembled as set forth in the above definition, see this class, subclasses 209 and 210, and the notes thereto.

- (2) Note. Continue the search in this class, subclass 155.
- 157** This subclass is indented under subclass 156. Divided insulators in which the insulating parts have one or more aligned, through apertures for receiving a nail, screw, or like attaching element. Such devices are known as knobs or cleats.
- (1) Note. Compare this class, subclass 166, for one piece insulators having through apertures for receiving nails, screws, and similar elements.
- (2) Note. Continue the search in class 248, Supports, subclass 67.5.
- 158** This subclass is indented under subclass 137. Insulators combined with means for engaging or attaching to a supporting element or structure.
- (1) Note. Mere supports for insulators such as brackets, etc., not claimed in combination with the insulators nor otherwise restricted to use with electric conductors, have been placed in class 248, Supports, appropriate subclasses, particularly in subclasses 200+ and 317+, and this is so even though the bracket or other support is claimed as made in whole or in part of a material having inherent insulating properties; but where additional insulation features are claimed, such as insulating skirts, to shed rain, etc., classification is here (Class 174), in this subclass or indented subclasses.
- (2) Note. For insulators claimed in combination with a tower, pole or other overhead installation, see this class, subclass 40 and indented subclasses.
- (3) Note. For combinations of two or more insulators with their supporting or attaching means, see this class, subclass 148 and indented subclasses.
- (4) Note. For combinations of bushing type insulators with mounting or securing means, see this class, subclass 151 and indented subclasses.
- (5) Note. For mere terminal structures as defined in subclass 176, either per se or in combination with the insulator, see this class, subclass 176 and indented subclasses.
- 159** This subclass is indented under subclass 158. Devices consisting of a nail, staple, or similar fastening element adapted to secure one or more conductors to a wall or other supporting surface and provided with an insulating head, washer, strip or similar element for insulating the conductors.
- (1) Note. Compare subclasses 157 and 166 for insulators adapted to be secured to a support by means of a nail, screw, or similar fastening element, but in which the conductor is secured to the insulator in substantially spaced relation to the supporting surface.
- (2) Note. For fastening devices such as bolts, rivets, etc., having means for insulating the same from a structure penetrated by the fastening device, see this class, subclass 138.
- (3) Note. For driven, headed and screw threaded fastenings, per se, not having electrical characteristics, see Class 411, Expanded, Threaded, Headed, and Driven Fasteners, or Locked or Coupled Bolts or Nuts, even though formed in whole or in part of a material having inherent insulating properties.
- 160** This subclass is indented under subclass 158. Insulators having means associated therewith specially designed to engage a flexible supporting strand such as a span wire or messenger cable.
- (1) Note. Patents claiming two or more insulators combined with a messenger cable or other overhead supporting cable have been placed in this class, subclass 41, and cross-referenced here when necessary.
- (2) Note. For devices other than insulators for supporting a conductor or cable from

an overhead or messenger cable, see this class, subclass 41 and the notes thereto.

161 This subclass is indented under subclass 158. Devices constructed or arranged so as (a) to permit the insulator to be adjustably positioned with respect to its supporting structure, or (b) to permit relative motion between the insulator and its supporting structure. This includes, for example, suspension means, pivotally or movably mounted, brackets having adjustable sections, etc.

- (1) Note. Mere terminal devices of the link or clevis type are in this class, subclass 176 and indented subclasses, particularly subclasses 184 and 207.
- (2) Note. Insulating devices in which adjustability or movability is attained solely by reason of the inherent flexibility or resiliency of the insulating material are not here but will be found in this class, subclass 137 or the indented subclasses appropriate to the structure claimed.

162 This subclass is indented under subclass 158. Devices in which the insulator is positioned between and secured to a pair of brackets, flanges, cross-arms, or the like.

- (1) Note. Continue the search in Class 248, Supports, subclass 67.7.
- (2) Note. Plural assemblies of the type provided for here, including those known to the trade as "Secondary racks", have been placed in this class, subclass 149.
- (3) Note. For mere terminal devices of the link or clevis type in which the insulator is positioned between and secured to the arms of the link or clevis, see this class, subclass 176 and indented subclasses, especially subclasses 184 and 207.

163 This subclass is indented under subclass 158. Devices having means embracing or clamping the insulator, or its support, or both. Said means may include, for example, (1) a sleeve, ring, socket, cap, or other element which receives or encircles the insulator, or (2) a clamp for engaging the insulator and/or a

cross-arm or other support, or (3) insulators having flanges thereon for straddling a cross-arm or other support.

- (1) Note. For similar devices in which the insulator embracing or clamping element also embraces the conductors, see this class, subclasses 154 and 155.
- (2) Note. Insulators having integrally projecting stems for insertion in a cross-arm, wall, or similar support have been placed in this class, subclass 164.
- (3) Note. For the support embracing or clamping features, continue the search in class 248, Supports, subclasses 65 and indented subclasses and 200 and indented subclasses, particularly subclasses 72, 214, 218.4, 220.21, 226.11, and 309.1 and indented subclasses.

164 This subclass is indented under subclass 158. Devices in which the support securing or attaching means includes a portion extending into or through the support.

- (1) Note. Insulators having integral stem portions for mounting in a cross-arm, wall, or similar support are in this subclass.
- (2) Note. Insulator supports secured to a main support solely by nails, screws, or similar fastening elements not forming a part of the insulator support are excluded from this subclass and have been placed in this class, subclass 158, or other appropriate indented subclasses.
- (3) Note. For the support penetrating features, continue the search in class 248, Supports, subclasses 71 and 216 and indented subclasses.

165 This subclass is indented under subclass 164. Devices of the type having a portion in the form of a pin, rod, belt, stud, or similar element secured within a socket formed in the insulating body.

- (1) Note. For mere pin terminals, see this class, subclass 176 and indented sub-

classes, especially subclasses 180, 182, 185, and 194 and indented subclasses.

166 This subclass is indented under subclass 164. Insulators in which the insulating body is provided with one or more through apertures for receiving nails, screws, or similar elements adapted to clamp the insulating body to a supporting surface.

- (1) Note. For divided insulators having similar attaching means, see this class, subclass 157.

167 This subclass is indented under subclass 137. Devices in which the insulating body is provided with at least one through aperture for receiving a conductor.

- (1) Note. Insulating tubes, spools, and other bushing type insulators, other than divided insulators, not claimed in combination with a wall, plate or other holding means, or restricted by structure to use therewith, have been placed in this subclass.
- (2) Note. For other insulators having through apertures for receiving conductors, see this class, subclass 151 and indented subclasses, for bushings mounted in a wall or plate or restricted to use therewith; subclasses 154 and 155, for insulators mounted in an embracing holder or restricted to use therewith, and subclasses 155, 156 and 157, for divided insulators.
- (3) Note. For insulators having through apertures for receiving supporting or terminal elements, see this class, subclasses 157, 166, 184, 207, and 208.
- (4) Note. For insulators having slots and grooves for receiving conductors, see this class, subclasses 174 and 175.

168 This subclass is indented under subclass 137. Insulating devices having means for holding or securing one or more conductors.

- (1) Note. For insulators having means specially designed for holding structures or

articles other than conductors, see this class, subclass 138.

- (2) Note. For insulators combined with conductor holding means specially designed to electrically connect two or more conductors, see this class, subclass 145.
- (3) Note. For devices for holding conductors on insulators not claimed in combination with the insulator nor otherwise restricted to use with electric conductors, and for analogous devices for holding cord and rope, see Class 24, Buckles, Buttons, Clasps, etc., appropriate subclasses, especially subclasses 115 and 339+ and their indented subclasses.
- (4) Note. For insulators combined with means specialized for holding either overhead or underground conductors, such as trolley wires or third rails, so as to permit travel of a current collector therealong, see Class 191, Electricity: Transmission to Vehicles, subclasses 32 and 42.
- (5) Note. For analogous devices for securing the wires of wire fences to the fence posts or poles, see Class 256, Fences, subclass 47 and indented subclasses.

169 This subclass is indented under subclass 168. Devices in which the conductor is held in or on a member other than the insulating body proper, which member is in turn secured or adapted to be secured to the insulating body. This includes, for example, caps, pins, and other elements having a portion secured to the insulator and another portion provided with conductor receiving means.

- (1) Note. This subclass and indented subclasses do not include devices designed to hold or position the conductor on the surface of the insulator or in a groove or slot formed therein. Such devices are in this class, subclass 168, or other appropriate indented subclass.
- (2) Note. For inventions in the manner of securing the fitting or terminal to the insulating body, see this class, subclass 176 and indented subclasses.

- 170** This subclass is indented under subclass 169. Devices in which the conductor holding element is of hook form.
- 171** This subclass is indented under subclass 169. Devices in which the conductor holding element is specially designed for use with a conductor having a cross-section other than circular.
- (1) Note. See note (4) of subclass 168 of this class.
- 172** This subclass is indented under subclass 168. Devices in which the conductor is held on the insulating body, usually in a groove or slot, formed therein by retaining means having a clamp or other portion embracing the insulator.
- SEE OR SEARCH CLASS:
192, Clutches and Power-Stop Control, subclasses 1.1+, for other types of combined electric motor and brake combinations.
- 173** This subclass is indented under subclass 172. Devices in which the conductor retaining means consists of a flexible strand bent, wrapped or twisted about the conductor and insulator.
- (1) Note. Similar devices having preformed eyes, hooks, or other attaching portions, and tie wires which do not embrace the insulator have been placed in this class, subclass 168 and other appropriate indented subclass.
- (2) Note. See Class 256, Fences, subclasses 57 and 71, and the notes thereto.
- 174** This subclass is indented under subclass 168. Devices in which the structure of the insulating body is modified, as by means of grooves, slots, projections, etc., to provide conductor receiving or attaching portions.
- (1) Note. Such insulators combined with devices for holding the conductor in the slots or grooves, or about the projections of the insulator, have been placed in this class, subclass 168 or other appropriate subclass indented thereunder.
- (2) Note. For insulator structures in which the conductor receiving means comprises a through perforation formed in the insulator body, see this class, subclass 167 and the notes thereto.
- (3) Note. Compare Class 24, Buckles, Buttons, Clasps, etc., subclass 129 and indented subclasses, for one-piece cord and rope holders.
- 175** This subclass is indented under subclass 174. Insulator structures designed to hold or retain a conductor without the employment of auxiliary fastening or retaining means. This includes, for example, insulators having conductor-receiving slots or passageways formed therein with tortuous or restricted entranceways to prevent separation of the conductor under ordinary installation conditions, and even though the conductor is loosely positioned and free to move longitudinally through the insulator.
- (1) Note. Compare Class 256, Fences, subclass 53.
- 176** This subclass is indented under subclass 137. Insulators combined with one or more terminal elements, as defined in the following note:
- (1) Note. A “terminal element” as used herein is that portion of an insulator support, conductor holder, or other insulator attachment which is secured to the insulating body. This includes, for example, caps, pins, links, or clevises, but when significant features of the means whereby these elements are secured to supports, conductors, or other devices, are claimed, the patent will be classified in the appropriate subclass above for such features and cross-referenced to this subclass and indented subclasses, when necessary.
- 177** This subclass is indented under subclass 176. Insulators having two or more terminal elements.
- (1) Note. This subclass takes all insulators having more than two terminals, and also such two-terminal insulators as are not provided for in the indented subclasses.

- 178** This subclass is indented under subclass 177. Two-terminal insulators comprising two or more insulating parts, sections, or materials.
- (1) Note. For multi-part insulators combined with single pin-type terminals, see this class subclass 195.
 - (2) Note. For other multi-part, sectional, or composite insulators, see this class, subclasses 209 and 210 and the notes thereto.
- 179** This subclass is indented under subclass 178. Two-terminal insulators comprising an elongated insulating core enclosed in a tubular structure of other insulating material.
- 180** This subclass is indented under subclass 178. Two-terminal insulators in which one of the terminal elements is a pin, as defined in subclass 194, and the other is a member having a portion embracing one end of said pin, but insulated therefrom.
- (1) Note. For similar terminal arrangements combined with one-piece insulators, see this class, subclasses 182 and 185.
- 181** This subclass is indented under subclass 177. Two-terminal insulators in which a metallic element, insulated from the terminal elements, (a) reinforces the insulating body or (b) prevents mechanical separation of the terminal elements in the event the insulating body is broken or otherwise destroyed.
- (1) Note. For other metal reinforced insulators, see this class, subclasses 209 and 210.
- 182** This subclass is indented under subclass 177. Two-terminal insulators in which one of the terminals comprises a pin, as defined in subclass 194, and the other terminal comprises a cap, as defined in subclass 188, coaxially positioned with respect to the pin.
- (1) Note. Compare this class, subclasses 180 and 185, for insulators having pin terminals combined with coaxially positioned terminals other than caps.
- (2) Note. For other insulators having cap-type terminals, see this class, subclasses 186 and 188 and indented subclasses.
 - (3) Note. For other insulators having pin type terminals, see this class, subclasses 180, 185 and 194 and indented subclasses.
- 183** This subclass is indented under subclass 177. Two-terminal insulators, the terminals being insulated from one another but overlapping one another in the direction of the axis of the insulator.
- (1) Note. Where the overlapping terminals comprise a cap and pin respectively, see this class, subclass 182.
 - (2) Note. For similar terminal arrangements combined with multi-part, sectional, or composite insulators, see this class, subclass 178 and indented subclasses.
- 184** This subclass is indented under subclass 183. Two-terminal insulators in which the terminals, usually in the form of links, clevises, or loops, are arranged to inter-link one another.
- (1) Note. For insulators combined with a single link or clevis type terminal, see this class, subclass 207.
 - (2) Note. For insulator structures, per se, specially designed for use with link or clevis type terminals, see this class, subclass 208.
- 185** This subclass is indented under subclass 183. Two-terminal insulators in which one of the terminals has a pin portion, as defined in subclass 194, and the other terminal has a portion coaxially positioned with respect to said pin portion but insulated therefrom.
- (1) Note. Continue the search in this class, subclass 180.
- 186** This subclass is indented under subclass 177. Two-terminal insulators in which each terminal comprises a cap portion, as defined in subclass 188.

- (1) Note. For other insulators having cap-type terminals, see this class, subclasses 182 and 188 and indented subclasses.
- 187** This subclass is indented under subclass 176. Insulators in which a terminal element is constructed or arranged to permit ventilation of a chamber or space formed in the insulating body.
- (1) Note. Compare this class, subclass 16.
- 188** This subclass is indented under subclass 176. Insulators claimed in combination with a single terminal of the type comprising a cup-shaped element in which at least a portion of the insulating body is secured.
- (1) Note. For other insulators having cap type terminals, see this class, subclasses 182 and 186, and compare subclasses 180 and 185.
- (2) Note. For insulator supports having cup-shaped portions in which the insulator is secured, see this class, subclass 163.
- 189** This subclass is indented under subclass 188. Insulators in which the insulating body is molded within the cap terminal, or is secured therein by means including a plastic bonding material, such as, for example, cement or alloy.
- (1) Note. For insulators having pin-type terminals secured by plastic bonding material, see this class, subclass 196.
- SEE OR SEARCH CLASS:
403, Joints and Connections, subclasses 265+ and subclasses specified in the notes to the definition of that subclass for miscellaneous bonded joints.
- 190** This subclass is indented under subclass 188. Insulators in which the cap terminal is longitudinally divided to facilitate assembly about the insulating body.
- 191** This subclass is indented under subclass 188. Insulators in which the insulating body is secured within the cap terminal by means including a clamp or clasp. This includes the use of set screws or like devices projecting through the wall or rim of the cap for clamping the insulating body.
- (1) Note. Compare this class, subclass 197, for insulators having pin-type terminal secured by clamps or clasps.
- 192** This subclass is indented under subclass 188. Insulators in which the insulating body is secured within the cap terminal by means including a ring, wedge, or other similar element interposed between the cap and the insulating body.
- (1) Note. Where in addition to such interposed element a plastic bonding material is employed, the patent is placed in this class, subclass 189 and cross-referenced here.
- (2) Note. For insulators having pin-type terminals secured by interposed rings or wedges, see this class, subclass 198.
- 193** This subclass is indented under subclass 188. Insulators in which the insulating body is secured within the cap terminal by means including a threaded or bayonet joint.
- (1) Note. For insulators having pin-type terminals secured by a threaded or bayonet joint, see this class, subclass 202.
- 194** This subclass is indented under subclass 176. Insulators claimed in combination with a single terminal of the type comprising a pin, rod, bolt, stud, or similar element secured within a socket or hole formed in the insulating body.
- (1) Note. For other insulators having pin-type terminals, see this class, subclasses 180, 182 and 185.
- (2) Note. For insulator supports having a pin portion secured within a socket or opening in the insulating body, see this class, subclass 158 and indented subclasses, particularly subclass 165.
- (3) Note. For the broader aspects of joints between a pin terminal and an insulator body, or for similar joints not limited to insulators, see Class 403, Joints and Connections, appropriate subclasses,

especially subclasses 230+, 299+ and 361+.

195 This subclass is indented under subclass 194. Insulators comprising two or more insulating parts or sections.

- (1) Note. For multi-part insulators combined with two or more terminals, see this class, subclass 178 and indented subclasses.
- (2) Note. For other multi-part, sectional, or composite insulators, see this class, subclasses 209 and 210 and the notes thereto.
- (3) Note. For insulators having sockets provided with mere thimbles or linings for receiving the pin terminal, see this class, subclass 200, even though the thimble or lining is of insulating material.

196 This subclass is indented under subclass 194. Insulators in which the insulating body is molded around the pin terminal, or is secured thereto by means including a plastic bonding material such as, for example, cement or alloy.

- (1) Note. For insulators having cap-type terminals secured by plastic bonding material, see this class, subclass 189.

SEE OR SEARCH CLASS:

403, Joints and Connections, subclasses 265+ and the classes and subclasses specified in the notes to the definition of that subclass for miscellaneous bonded joints.

197 This subclass is indented under subclass 194. Insulators in which the pin is secured within the insulator by means including a clamp or clasp.

- (1) Note. Compare this class, subclass 191, for insulators having cap-type terminals secured by clamps or clasps.

198 This subclass is indented under subclass 194. Insulators in which the pin is secured within the insulator by means including a ring, wedge, or other similar element interposed between the pin and insulating body.

- (1) Note. Where in addition to such interposed element a plastic bonding material is employed, the patent is placed in this class, subclass 196 and cross-referenced here.

- (2) Note. For insulators having cap-type terminals secured by interposed rings or wedges, see this class, subclass 192.

199 This subclass is indented under subclass 194. Insulators in which the pin terminal has a portion expanded within the insulator socket to secure it in place.

SEE OR SEARCH CLASS:

403, Joints and Connections, subclasses 230+.

411, Expanded, Threaded, Driven, Headed, Tool-Deformed, or Locked-Threaded Fastener, subclasses 15+ for expanding anchors.

200 This subclass is indented under subclass 194. Insulators in which the socket in the insulator is provided with a lining or shell commonly known as a thimble for receiving the pin.

- (1) Note. Compare this class, subclasses 195 and 210, for multi-part insulators comprising nested, cup-shaped parts, the inner-most of which is provided with a pin receiving socket.
- (2) Note. See this class, subclass 202 and indented subclasses, for thimbles forming a part of, or attached to, the pin and secured in the insulator by means of a threaded or bayonet joint.

201 This subclass is indented under subclass 194. Insulators having a hole extending entirely therethrough for receiving the pin.

- (1) Note. Compare this class, subclasses 157, 162 and 166, for insulators having through openings for receiving a supporting element.

202 This subclass is indented under subclass 194. Insulators in which the pin is secured in the insulator by means including a threaded or bayonet joint.

- (1) Note. For insulators having cap-type terminals secured by a threaded or bayonet joint, see this class, subclass 193.
- (2) Note. For joints of the screw or bayonet type, using a thimble, see this class, subclass 200.
- (3) Note. For screw-threaded fasteners generally, see Class 411, Expanded, Threaded, Driven, Headed, Tool-Deformed, or Locked-Threaded Fastener, appropriate subclasses.
- (4) Note. See Class 403, Joints and Connections, for mere joints, particularly subclass 343 for screw type joints.
- 203** This subclass is indented under subclass 202. Insulators in which the thread is of strand form, i.e., not formed integrally with a base.
- (1) Note. Strands of fibrous or other soft material set in a screw groove are in this subclass. For other soft or yielding material screw pins, see this class, subclass 205.
- 204** This subclass is indented under subclass 202. Insulators in which the pin thread is formed in sheet material.
- 205** This subclass is indented under subclass 202. Insulators in which the pin, or some insulator contacting part thereof, is of soft or yielding material.
- (1) Note. Wood pins when used because of their yielding character are here.
- (2) Note. These devices are for the most part to prevent excessive mechanical stresses in the insulator due to differential expansion between the pin and insulator.
- (3) Note. For soft or yielding structures of the kind above provided for, see the appropriate structural group of this class, particularly subclasses 200, 203, and 204.
- 206** This subclass is indented under subclass 202. Insulator structures claiming the socket structure, per se, for receiving pin terminals of the screw or bayonet type.
- (1) Note. For insulator structures having sockets provided with pin receiving screw thimbles, see this class, subclass 200.
- 207** This subclass is indented under subclass 176. Insulators having a single terminal in the form of a link, clevis, or loop, a portion of which extends through or around the insulator.
- (1) Note. Complete the search in this class, subclass 184.
- (2) Note. For insulator structures per se of the type adapted to receive link or clevis terminal, see this class, subclass 208.
- (3) Note. For mere links or clevises of the type employed in chain structure see Class 59, Chain, Staple, and Horseshoe Making, subclass 78 and indented subclasses.
- (4) Note. For mere joints between a link or clevis and a fitting for the same, see Class 403, Joints and Connections, particularly subclasses 150+.
- 208** This subclass is indented under subclass 137. Insulators of the type providing passages such as grooves or openings for the reception of a link, clevis, or loop.
- (1) Note. For similar structures combined with terminals see this class, subclasses 184 and 207.
- (2) Note. For other insulator structures having through apertures, see this class, subclass 167 and the notes thereto.
- 209** This subclass is indented under subclass 137. Insulators in which the insulating device is composed of (1) two or more insulating parts or sections suitably assembled to provide a unitary insulating structure, or (2) an insulating body coated or covered with other insulating material, or (3) an insulating body provided

with mere reinforcing elements. Such reinforcing elements may be metallic provided they have no electrical function.

- (1) Note. See this class, subclass 140 and indented subclasses, for insulators coated with conductive material for stress distributing purposes.
 - (2) Note. For similar structures combined with terminal elements, see this class, subclasses 178 and indented subclasses, 181 and 195.
 - (3) Note. For multi-part insulators of the type in which one or more conductors are clamped or otherwise secured between two or more insulating parts, see this class, subclasses 155, 156 and 157.
 - (4) Note. For multi-part insulators of the bushing type, or otherwise specially designed to insulate a conductor from a wall or plate through which the conductor passes, see this class, subclasses 151 and indented subclasses and 167.
 - (5) Note. Compare this class, subclass 148 and indented subclasses, for assemblies or combinations of two or more complete insulators.
 - (6) Note. For electric conductors insulated with composite or plural-layer insulation, see this class, subclass 120 and indented subclasses.
 - (7) Note. See Class 156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 47+ for methods of laminating indefinite length electrical conductors.
- 210** This subclass is indented under subclass 209. Insulators of the type in which a plurality of cup-shaped insulating elements are nested one within another. One of the cup-shaped elements usually exposes its socket to the exterior of the structure, which socket may be used for the reception of a terminal or supporting element.

- (1) Note. For similar structures claimed in combination with the terminal element, see this class, subclass 195.

211 This subclass is indented under subclass 137. Insulators having a structure specially designed to disperse or to facilitate shedding or disposal of rain, atmospheric moisture or other foreign matter. The means for accomplishing this may consist, for example, of petticoats, skirts, flanges, ribs, etc., modified for this purpose, or drainage openings, grooves, channels, etc.

- (1) Note. For insulators having means for handling or dealing with fluids other than rain or atmospheric moisture, see this class, subclasses 30 and 31.
- (2) Note. See this class, subclass 139 and indented subclasses, for insulators combined with heating means to dry or prevent moisture from condensing.

212 This subclass is indented under subclass 137. Insulators in which the shape or external configuration of the insulating body is specially designed to modify its electrical and/or mechanical characteristics. This includes, for example, insulators (1) having petticoats, skirts, or flanges formed or proportioned to distribute electrical stresses or increase the leakage path or (2) having strengthening ribs formed thereon, or (3) shaped to afford tool engaging surfaces to facilitate mounting the insulator, or (4) streamlined to reduce wind resistance.

- (1) Note. For insulators having a shape or surface designed to disperse or to facilitate shedding or removal of rain, moisture, or other foreign matter, see this class, subclass 211.
- (2) Note. For insulators having a shape or surface modified to provide conductor receiving or attaching means, see this class, subclass 168 and indented subclasses, especially subclasses 174 and 175.
- (3) Note. For insulators having a shape or surface modified to provide terminal receiving or attaching means, see this

class, subclass 176 and indented subclasses.

- (4) Note. For insulators having interlinking passages or grooves formed therein, see this class, subclass 208.
- (5) Note. For insulators having a shape or surface modified to provide support receiving or attaching means, see this class, subclass 158 and indented subclasses.

250 Preformed panel circuit arrangement (e.g., printed circuit):

This subclass is indented under subclass 68. Subject matter wherein a cable or conductor is formed on or attached to a panel or sheet-like insulating body so as to form a unitary structure.

- (1) Note. The conductor or cable may be made by coating a panel or sheet with conductive material, or by impregnating selected layers of the surface of an insulating body with conductive material, or by attaching preformed conductors to the surface of an insulating-body as by adhesives, etc. Note the reference to Class 428, Stock Material or Miscellaneous Articles, below.
- (2) Note. Included in this subclass are such "printed circuit" assemblies as include "branched" circuits (indented subclasses 71+), such assemblies as include joints between the ends of the cables or conductors (subclasses 84+), as well as other "printed circuit" structures properly classified in subclass 68 or one of the indented subclasses.
- (3) Note. This subclass and those indented thereunder include printed circuit boards having one or more electrical devices of the same type. Search Class 361, subclasses 397+ for printed circuit boards having plural, diverse electrical devices.

SEE OR SEARCH CLASS:

- 29, Metal Working, subclasses 829+ for the miscellaneous methods of manufacturing cable and conductor assem-

blies of the type classified in this subclass of Class 174.

- 257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), for integrated circuit structure with active solid-state devices, subclass 446 and 499+ for integrated circuit devices with electrically isolated components, in general, subclasses 678-733 for housings, in general, subclasses 787-796 for encapsulated devices, in general, and other appropriate subclasses for specific type devices in integrated circuits, or with a housing, or with encapsulation.
- 330, Amplifiers, subclass 66 for amplifier printed circuit boards, per se.
- 335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclass 199 for electromagnetically operated switches where at least a part of the switch contact structure includes a printed circuit.
- 361, Electricity: Electrical Systems and Devices, subclasses 397+ for printed circuit boards having diverse electrical devices.
- 427, Coating Processes, subclasses 96+ for chemical coating processes which produce printed circuits and printed circuit boards.
- 428, Stock Material or Miscellaneous Articles, appropriate subclasses, for a single or plural layer stock material product which involves no more structure than a base having a conductive layer coated thereon or impregnated therein, see especially subclass 67 for nonparticulate elements embedded or inlaid in a substrate and visible, subclasses 411+ for a nonstructural composite product characterized solely by the composition of the layers, subclass 601 for metallic stock having a discontinuous surface component, e.g., printed circuit, and subclass 901 (a cross-reference art collection) for a printed circuit device.
- 439, Electrical Connectors, subclasses 55+ for "printed circuit" assemblies which include detachable connectors.

251 With encapsulated wire:

This subclass is indented under subclass 250. Subject matter wherein the unitary structure includes a wire electrical conducting means embedded in, potted or molded over with a material which protects the wire from the surrounding environment.

SEE OR SEARCH THIS CLASS, SUBCLASS:

96, and 98, for embedded conductors, per se.

117, for insulated conductor assemblies of noncircular section.

252 With cooling means:

This subclass is indented under subclass 250. Subject matter including means to remove or prevent heat accumulation in the structure.

SEE OR SEARCH CLASS:

361, Electricity: Electrical Systems and Devices, subclass 381 for printed circuits with cooling means, where the printed circuits includes plural diverse electrical devices.

253 Micropanel:

This subclass is indented under subclass 250. Subject matter wherein the cable or conductor is not visible to the naked eye.

(1) Note. Usually the size of the structure is given in terms of microns and is smaller than 20 mils.

(2) Note. The micropanels of this class should not be confused with microstrip or microwave devices classified principally in Class 333, Wave Transmission Lines and Networks. (A microstrip is generally a flat conductor which coats with a single ground plane.)

(3) Note. Coating thickness of a conducting layer is insufficient for classification in this subclass.

254 Convertible shape (e.g., flexible) or circuit (e.g., breadboard):

This subclass is indented under subclass 250. Subject matter wherein the structure is either easily bent without breaking or has means to

easily change its conductor circuit configuration.

(1) Note. Terms that are somewhat synonymous with "breadboard" are "prototype" and "universal board".

SEE OR SEARCH CLASS:

361, Electricity: Electrical Systems and Devices, subclass 398 for flexible printed circuits which include plural, diverse electrical devices.

255 With particular substrate or support structure:

This subclass is indented under subclass 250. Subject matter including a material means distinguished by significant construction or configuration which provides a supporting surface for other materials, especially materials used as printed-circuits patterns.

256 With particular material:

This subclass is indented under subclass 250. Subject matter wherein at least a part of the circuit board structure is composed of one or more specific substances.

257 Conducting (e.g., ink):

This subclass is indented under subclass 256. Subject matter including a material adapted to the transmission of electricity.

(1) Note. The conducting material may be for example superconducting, semiconducting or resistive.

258 Insulating:

This subclass is indented under subclass 256. Subject matter including a material on or through which essentially no electrical current will flow.

259 Adhesive/bonding:

This subclass is indented under subclass 256. Subject matter including a material which causes parts of the structure to stick, bind or fasten together.

SEE OR SEARCH THIS CLASS, SUBCLASS:

263, for soldered feed through connections where the composition of the solder is nominal.

- SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, appropriate subclasses for adhesive methods and materials, per se.
- 260 With an electrical device:**
This subclass is indented under subclass 250. Subject matter wherein an electrical component other than a wire, cable or connector is part of the panel circuit arrangement.
- (1) Note. This subclass includes plural electrical devices of the same type.
- SEE OR SEARCH CLASS:
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 40+ for integrated chip devices, subclasses 72+ for encapsulated solid-state devices and subclasses 74+ for active solid-state devices combined with a housing.
361, Electricity: Electrical Systems and Devices, subclasses 358+ for electrical service distribution boxes including panel boards for electrical power distribution systems and devices.
- 261 With a particular conductive connection (e.g., crossover):**
This subclass is indented under subclass 250. Subject matter including details to the electrical interconnection of two or more electrically separate parts of the panel.
- 262 Feedthrough:**
This subclass is indented under subclass 261. Subject matter including a passage used to make electrical and mechanical connection between conductive patterns on plural planes of a printed circuit board.
- SEE OR SEARCH CLASS:
361, Electricity: Electrical Systems and Devices, subclass 410 for cross-connected patterns on printed circuit boards which include plural diverse electrical components.
- 263 With solder:**
This subclass is indented under subclass 262. Subject matter wherein the conductive material is a readily meltable metal or alloy that produces a bond at a junction of two metal surfaces.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
259, for bonding with solder in printed circuits where the solder has a significant composition.
- SEE OR SEARCH CLASS:
228, Metal Fusion Bonding, appropriate subclasses for soldering methods and devices, per se.
- 264 Voidless (e.g., solid):**
This subclass is indented under subclass 262. Subject matter wherein the conductive material is a solid that completely fills the feedthrough.
- 265 Preform in hole:**
This subclass is indented under subclass 264. Subject matter including a prefabricated solid conductive material insert for the feedthrough.
- 266 Hollow (e.g., plated cylindrical hole):**
This subclass is indented under subclass 262. Subject matter wherein the feedthrough surrounds an empty space.
- (1) Note. This subclass includes hollow preform inserts.
- 267 Termination post:**
This subclass is indented under subclass 261. Subject matter including an oblong piece of metal, either solid or hollow and of two or more diameters, which can be stacked, flared, swaged or pressed into a hole for the purpose of connecting leads or external wires to the conductive part of the panel.
- 268 With single conductive plane (e.g., tape, cable):**
This subclass is indented under subclass 250. Subject matter including a single layer of conductive material in a circuit arrangement supported by a layer of insulative material.

END